

UNCLASSIFIED

AD NUMBER
AD368085
CLASSIFICATION CHANGES
TO: unclassified - NATO
FROM: restricted - NATO
LIMITATION CHANGES
TO: Approved for public release, distribution unlimited
FROM: Distribution: DTIC users only.
AUTHORITY
Director, SACLANT Centre, 1989.; Same.

THIS PAGE IS UNCLASSIFIED

AD-368 085

SIN

The classified or limited status of this report applies to each page, unless otherwise marked.

Separate page printouts MUST be marked accordingly.

THIS DOCUMENT CONTAINS INFORMATION AFFECTING THE NATIONAL DEFENSE OF THE UNITED STATES WITHIN THE MEANING OF THE ESPIONAGE LAWS, TITLE 18, U.S.C., SECTIONS 793 AND 794. THE TRANSMISSION OR THE REVELATION OF ITS CONTENTS IN ANY MANNER TO AN UNAUTHORIZED PERSON IS PROHIBITED BY LAW.

NOTICE: When government or other drawings, specifications or other data are used for any purpose other than in connection with a definitely related government procurement operation, the U. S. Government thereby incurs no responsibility, nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use or sell any patented invention that may in any way be related thereto.

UNCLASSIFIED

368085

UNCLASSIFIED

U. S. J.
MODIFIED

Technical Report No. 82

(PART 2 - FIGURES)

SACLANT ASW
RESEARCH CENTRE

Study of the Oceanography of the Upper Layer in the N.E. Atlantic:

LOG OF DATA — PHASE A

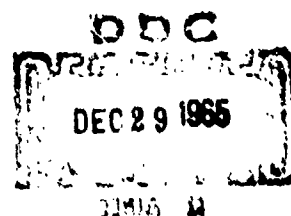
by

A. Dahme

1 NOVEMBER 1965

NATO

VIALE SAN BARTOLOMEO 92
LA SPEZIA ITALY



UNCLASSIFIED

UNCLASSIFIED

This document is released to a NATO Government at the direction of the SACLANTCEN subject to the following conditions:

1. The recipient NATO Government agrees to use its best endeavours to ensure that the information herein disclosed, whether or not it bears a security classification, is not dealt with in any manner (a) contrary to the intent of the provisions of the Charter of the Centre, or (b) prejudicial to the rights of the owner thereof to obtain patent, copyright, or other like statutory protection therefor.

2. If the technical information was originally released to the Centre by a NATO Government subject to restrictions clearly marked on this document the recipient NATO Government agrees to use its best endeavours to abide by the terms of the restrictions so imposed by the releasing Government.

UNCLASSIFIED

U.S. **UNCLASSIFIED**
MODIFIED BY **UNCLASSIFIED**
REF ID: A66000

TECHNICAL REPORT NO. 52

SACLANT ASW RESEARCH CENTRE
Viale San Bartolomeo 92
La Spezia, Italy

STUDY OF THE OCEANOGRAPHY OF THE UPPER LAYER IN THE
N. E. ATLANTIC

MILOC 64 DATA - PHASE A

By

A. Dahme

1 November 1965

APPROVED FOR DISTRIBUTION

Henrik Nodtvedt
HENRIK NODTVEDT
Director

UNCLASSIFIED
REF ID: A66000

This document contains information the National
Defense or the Department of Defense may
be required to disclose in the future.

TABLE OF CONTENTS

FIGURES

0.1	Proposed Survey Area
1.1	Area Surveyed
1.2	Tracks of Guide Ships
2.1 to 2.12	Sea Surface Temperatures
2.13 to 2.20	Difference: Injection Temperature minus SST
2.21 to 2.23	SST: ART and Bucket Comparisons
3.1	Classification of BT Traces
3.2 to 3.13	Layer Depth, SST, and Temperature Profiles
3.14 to 3.21	Comparison between Ships : Layer Depth and SST
4.1 to 4.5	Currents (GEK) and Average Wind
5.1 to 5.10	Wind Speed and Direction
5.11 to 5.22	Air Temperature
5.23 to 5.34	Difference: Air Temperature minus SST
5.35 to 5.46	Evaporation
5.47 to 5.49	Solar Radiation
6.1	PASWEPS 10-day SST Analysis
6.2	PASWEPS 10 day Layer Depth Analysis
6.3 & 6.4	Comparison of PASWEPS Input Data and MILOC SST measurements
6.5	Comparison of PASWEPS SST Analysis and MILOC SST measurements
6.6 & 6.7	Comparison of PASWEPS LD Analysis and MILOC LD measurements

U. S. CONFIDENTIAL
 MODIFIED BY [illegible] R17FE

MILOC 64

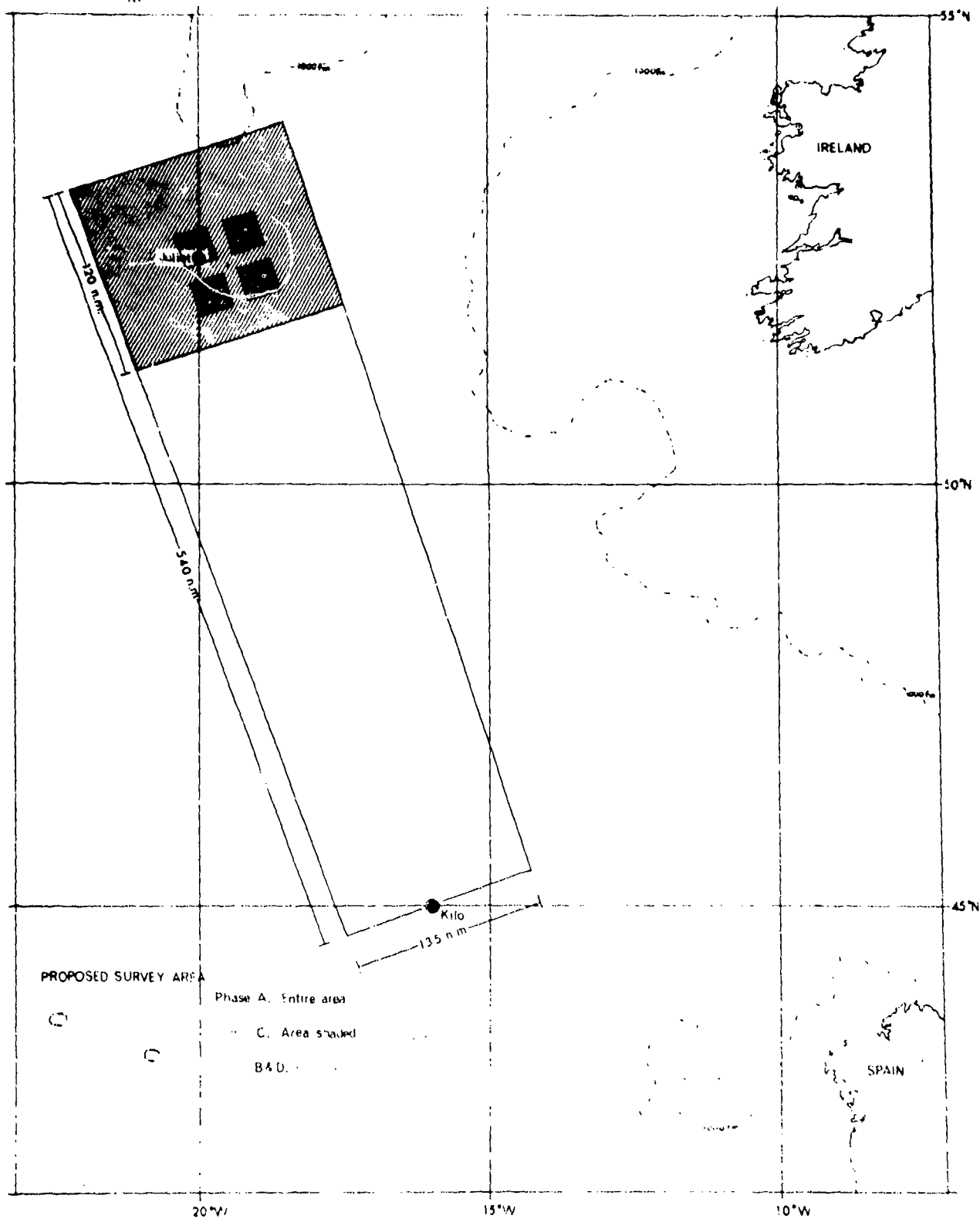


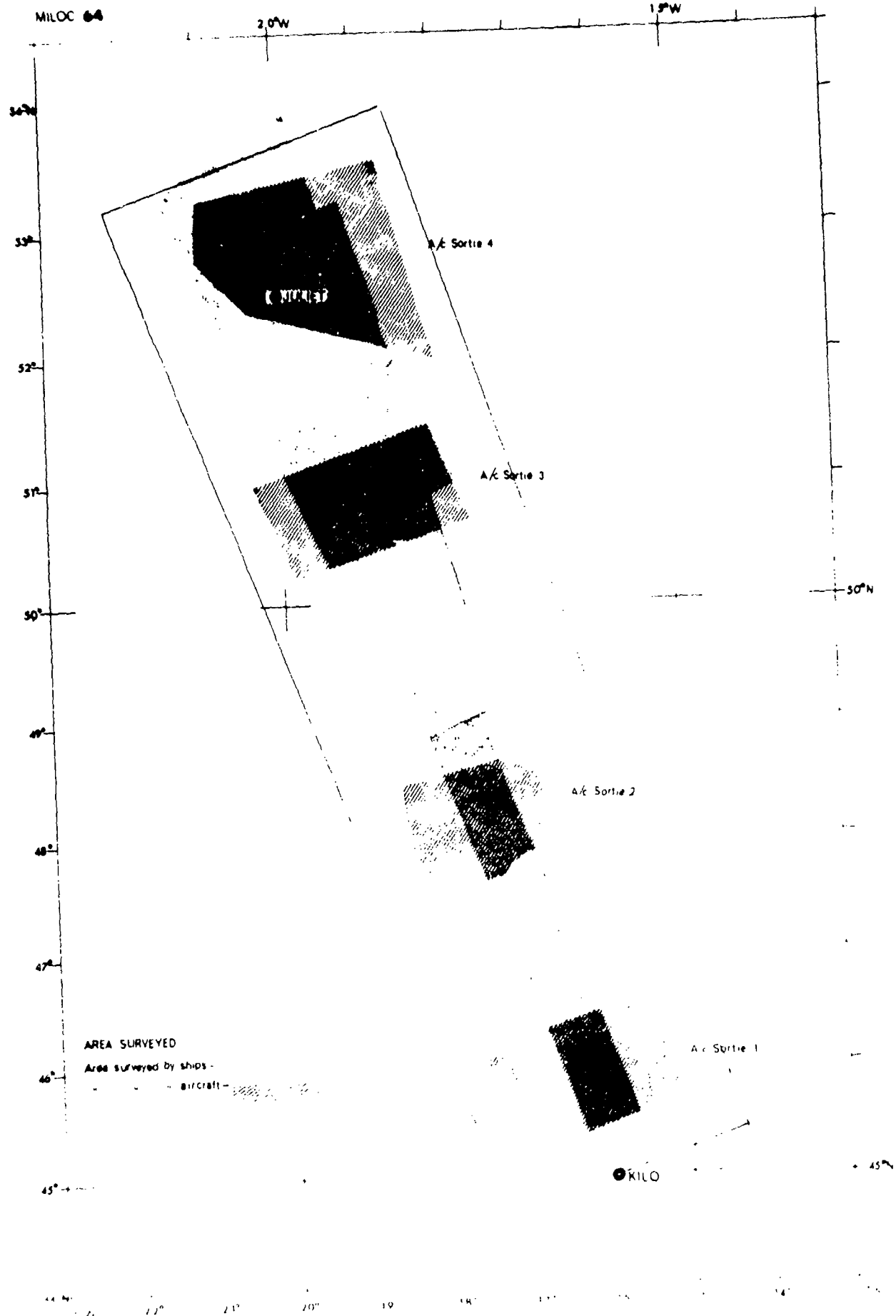
FIG. 0.1

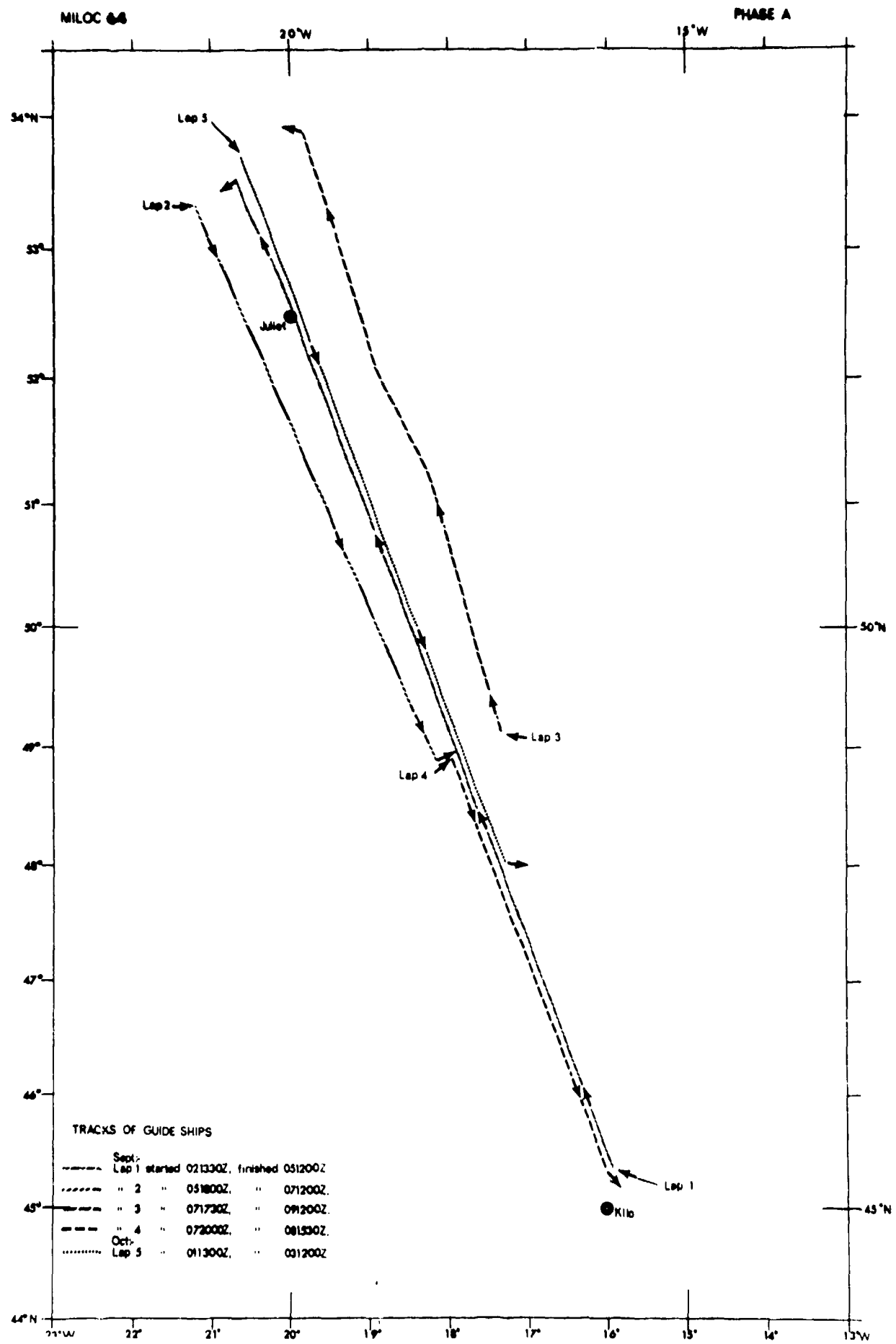
PHASE A.

MILOC 64

2,0W

15W





MILOC 64

Phase A, lap 1

João de Lisboa

Sea Surface Temperature

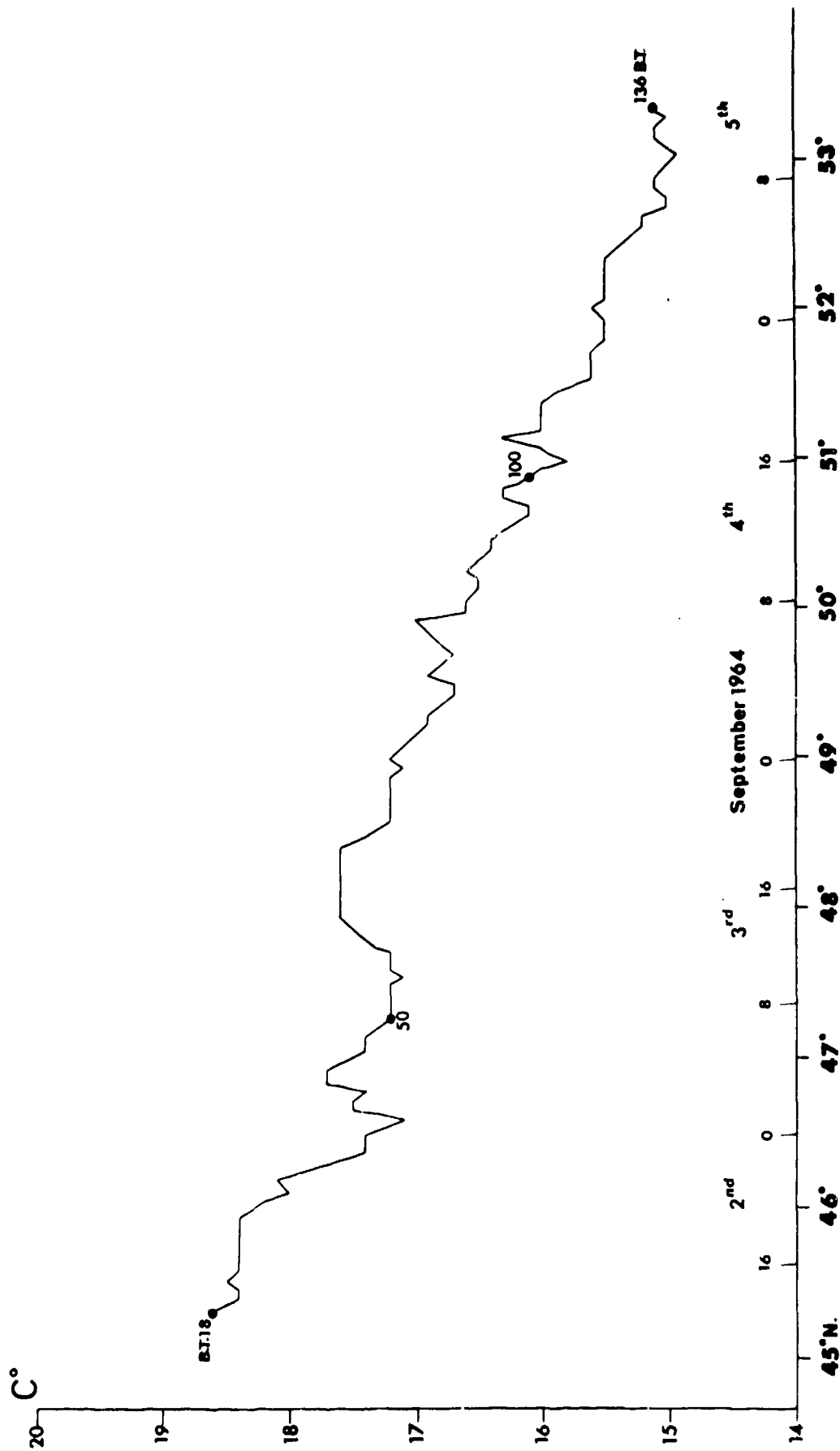


FIG. 2.1

MILOC 64

Phase A, lap 1

H.M.S. Dalrymple

Sea Surface Temperature

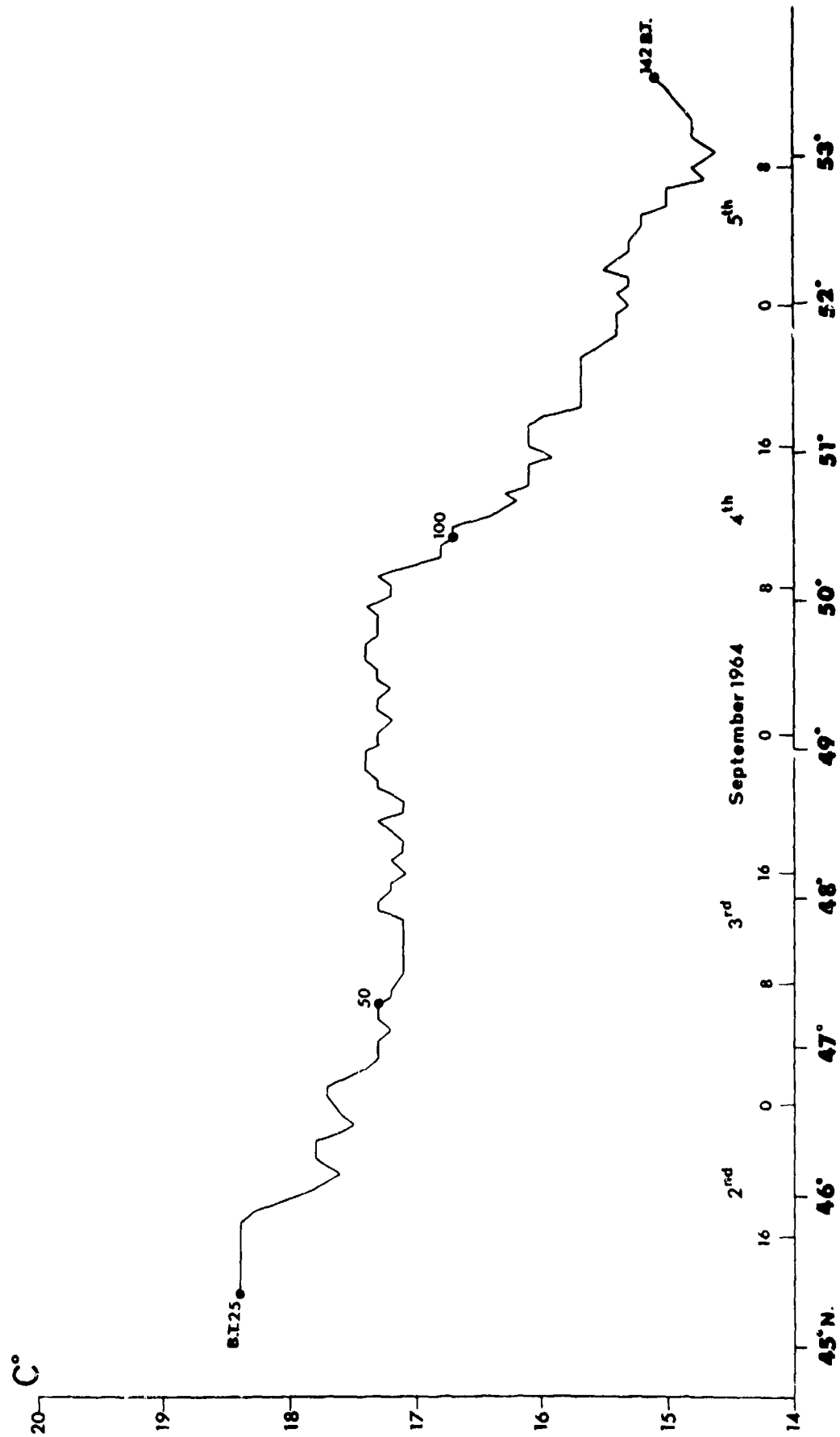


FIG. 2.2

MILOC 64

Phase A, lap 1

Maria Paolina G.

Sea Surface Temperature

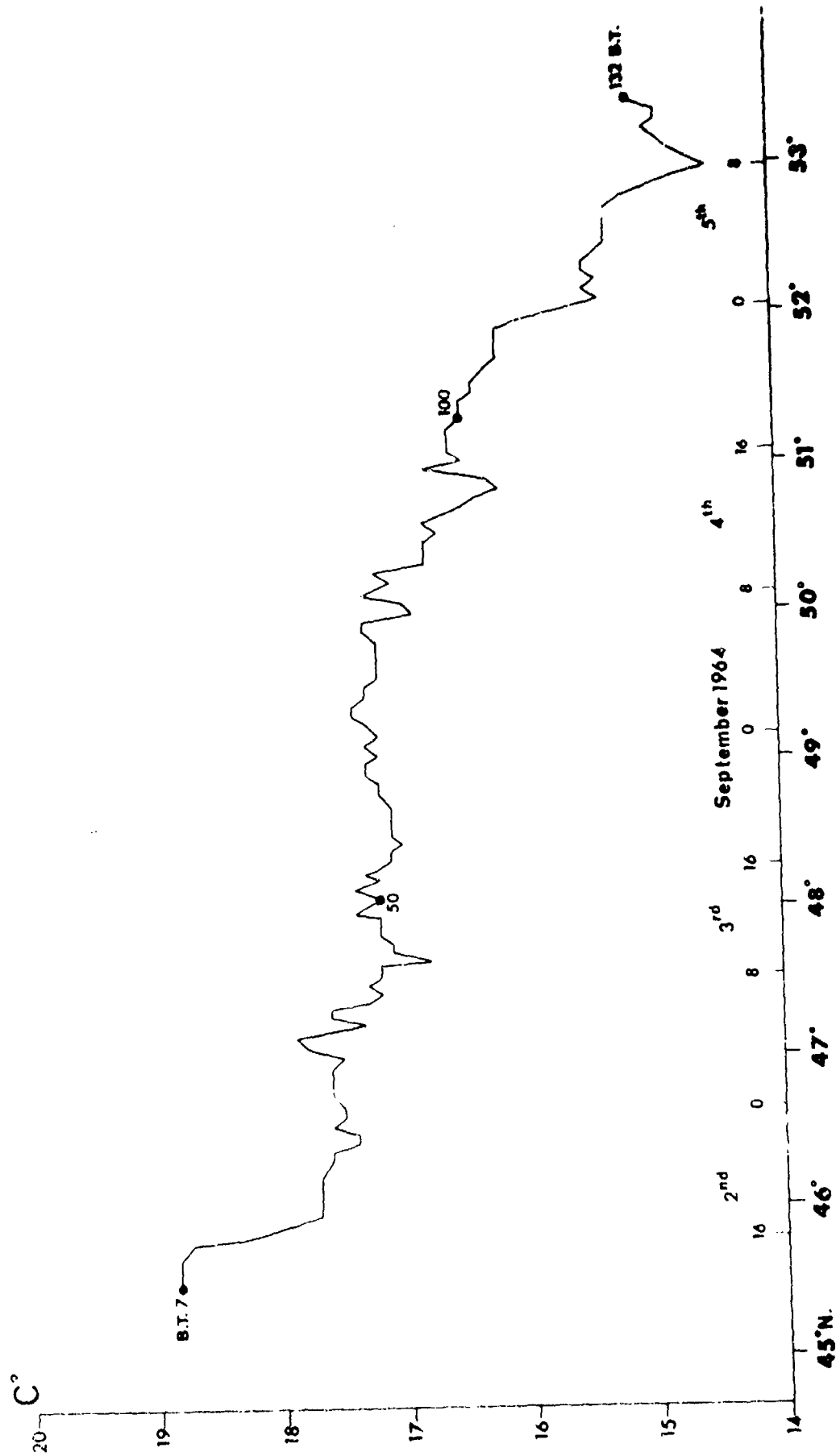


FIG. 2.3

MILOC 64

Phase A, lap 2

Sea Surface Temperature

João de Lisboa

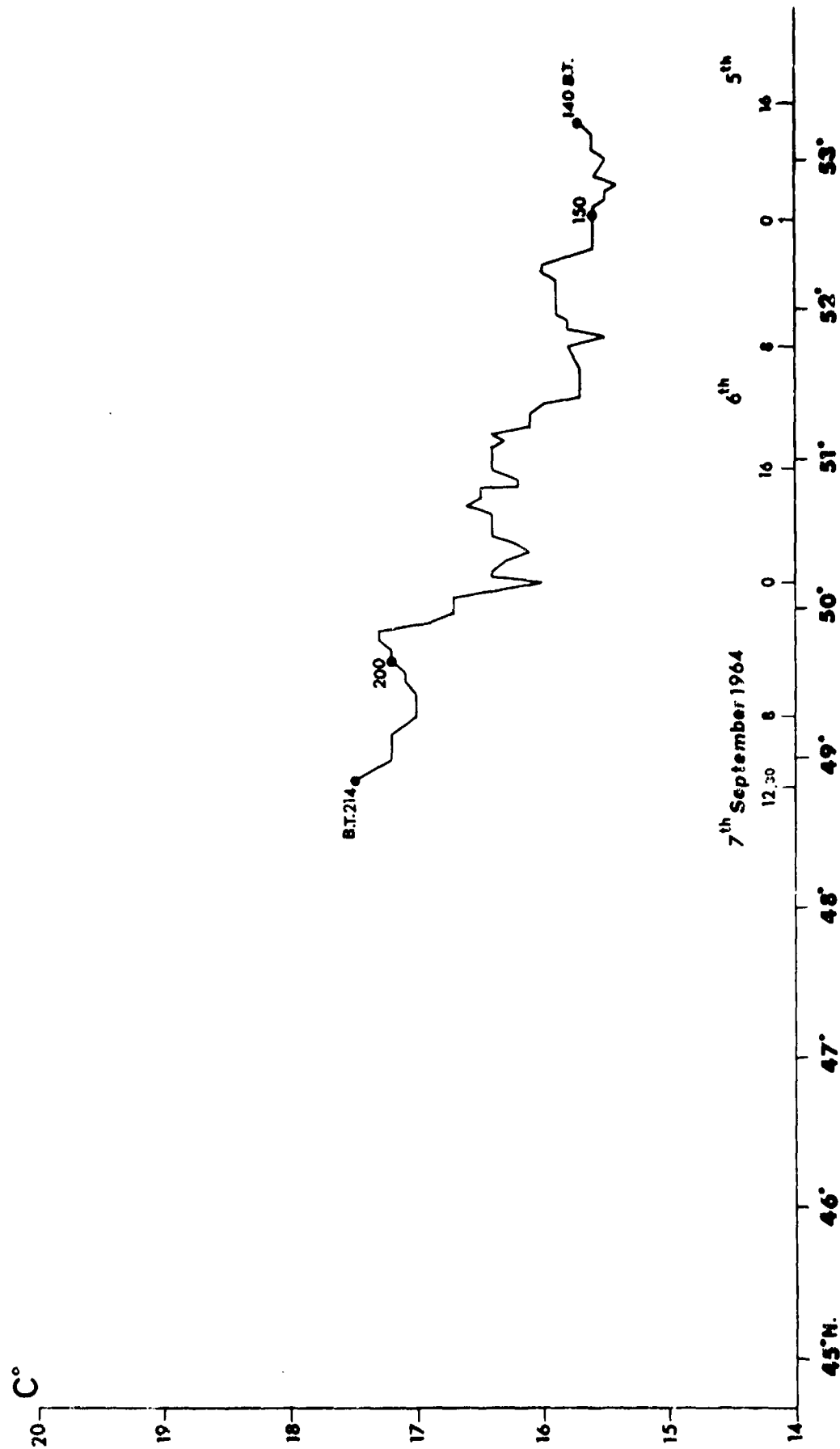


FIG. 2.4

MILOC 64

Phase A, lap 2

H.M.S. Dalrymple

Sea Surface Temperature

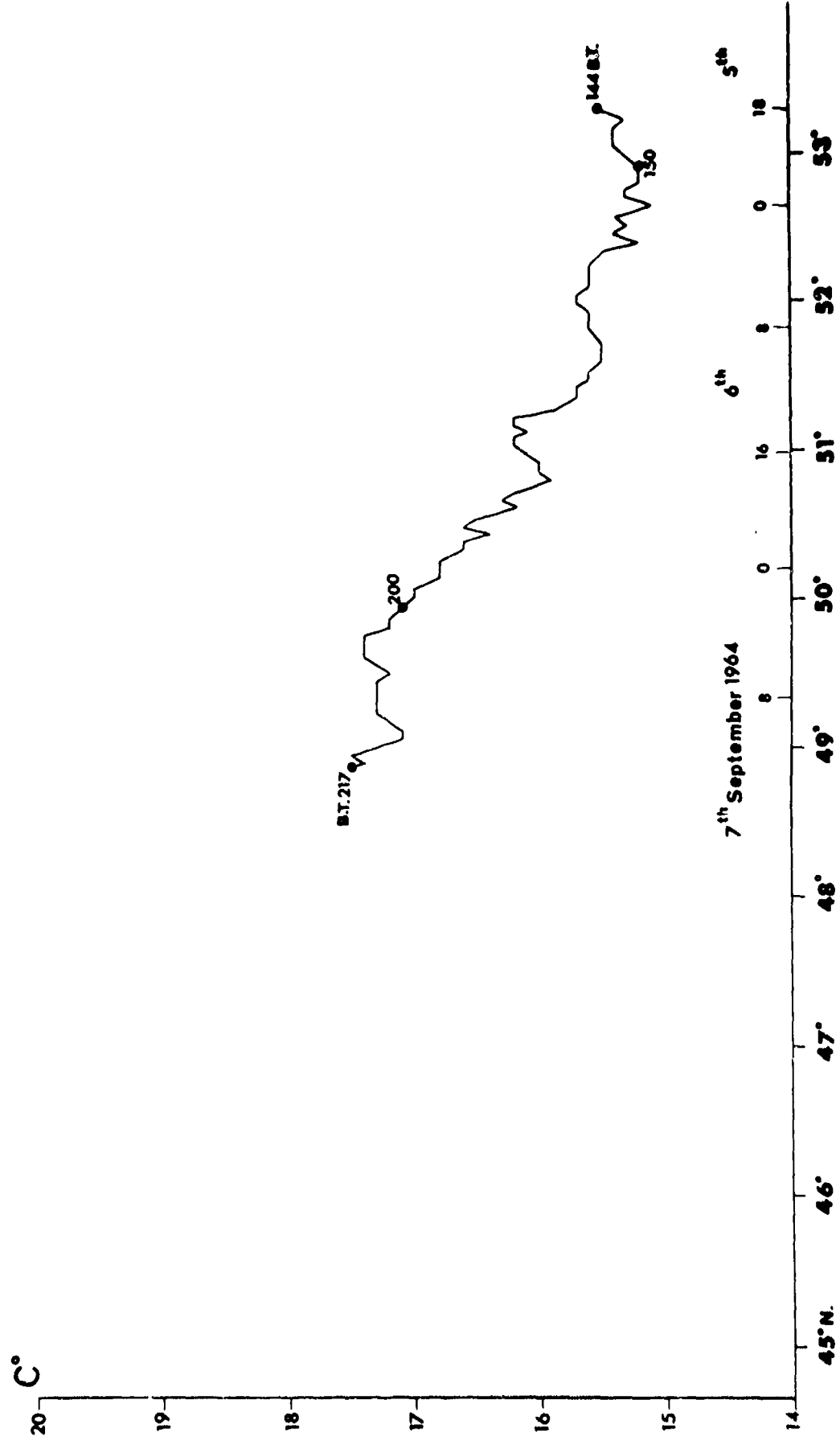


FIG. 2.5

MILOC 64

Phase A, lap 2

Sea Surface Temperature

Maria Padina G.

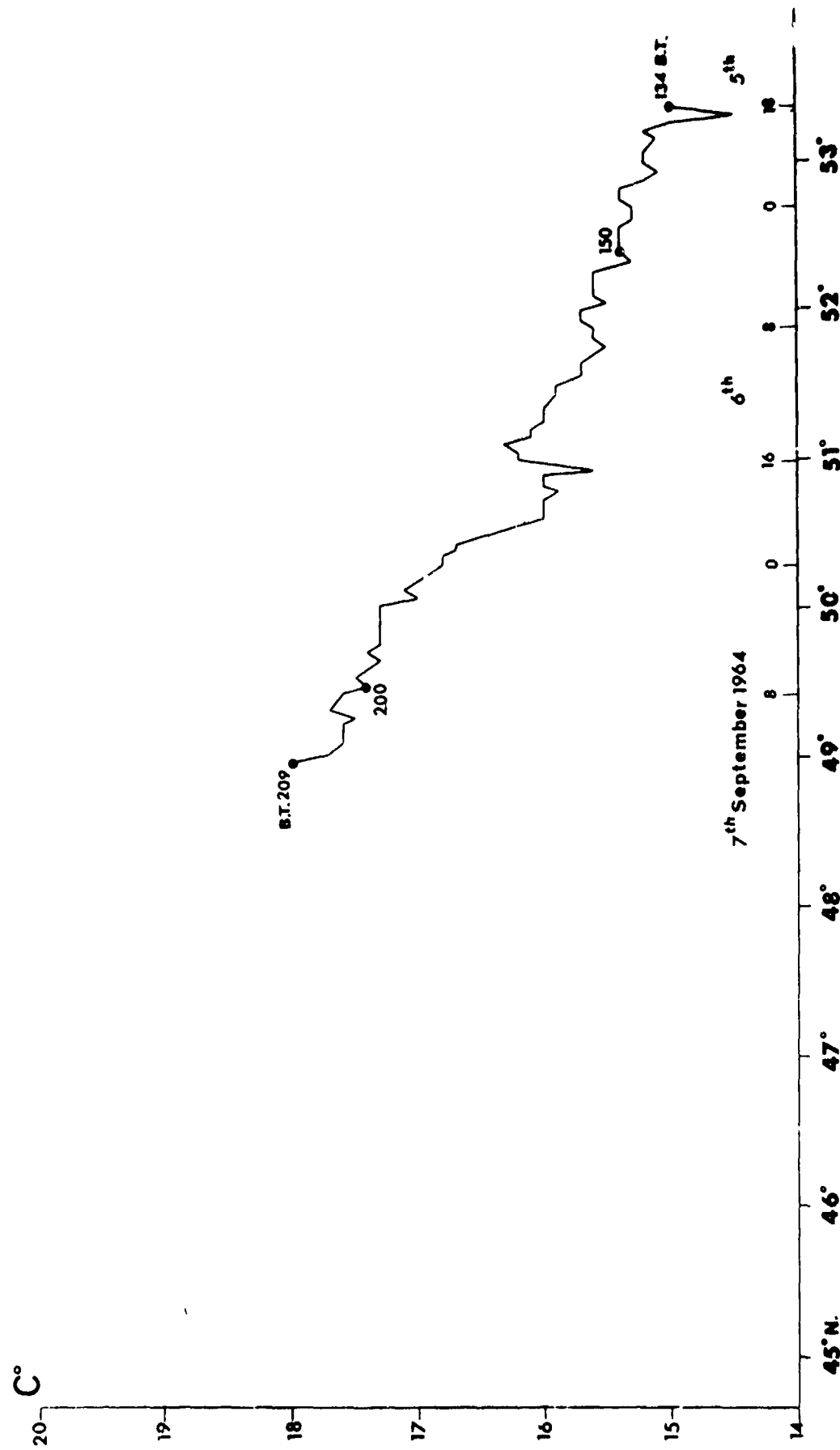


FIG. 2.6

MILOC 64

Phase A, lap 3

Maria Paolina G.

Sea Surface Temperature

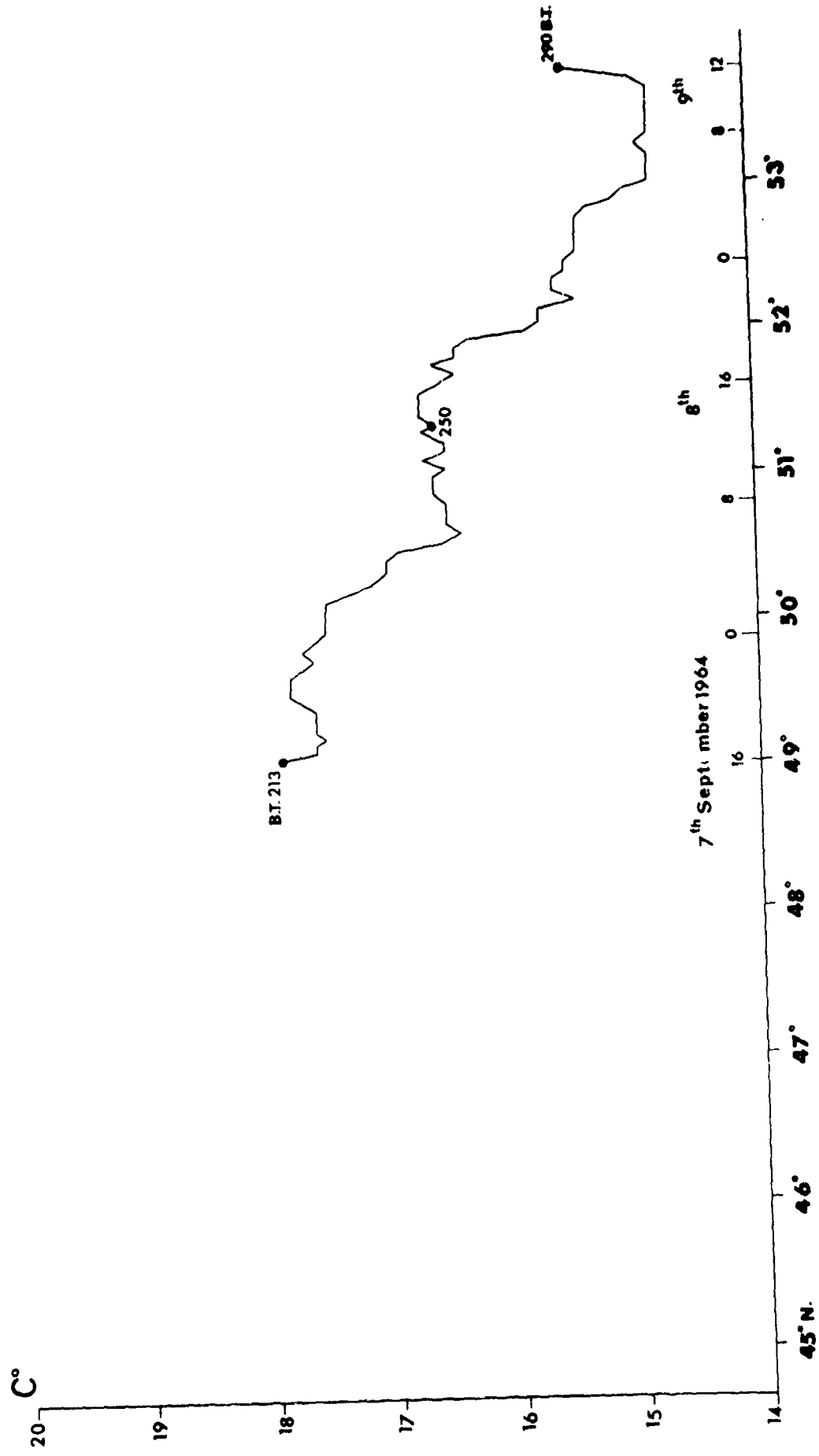


FIG. 2.7

MILOC 64

Phase A, lap 3

H.M.S. Dalrymple

Sea Surface Temperature

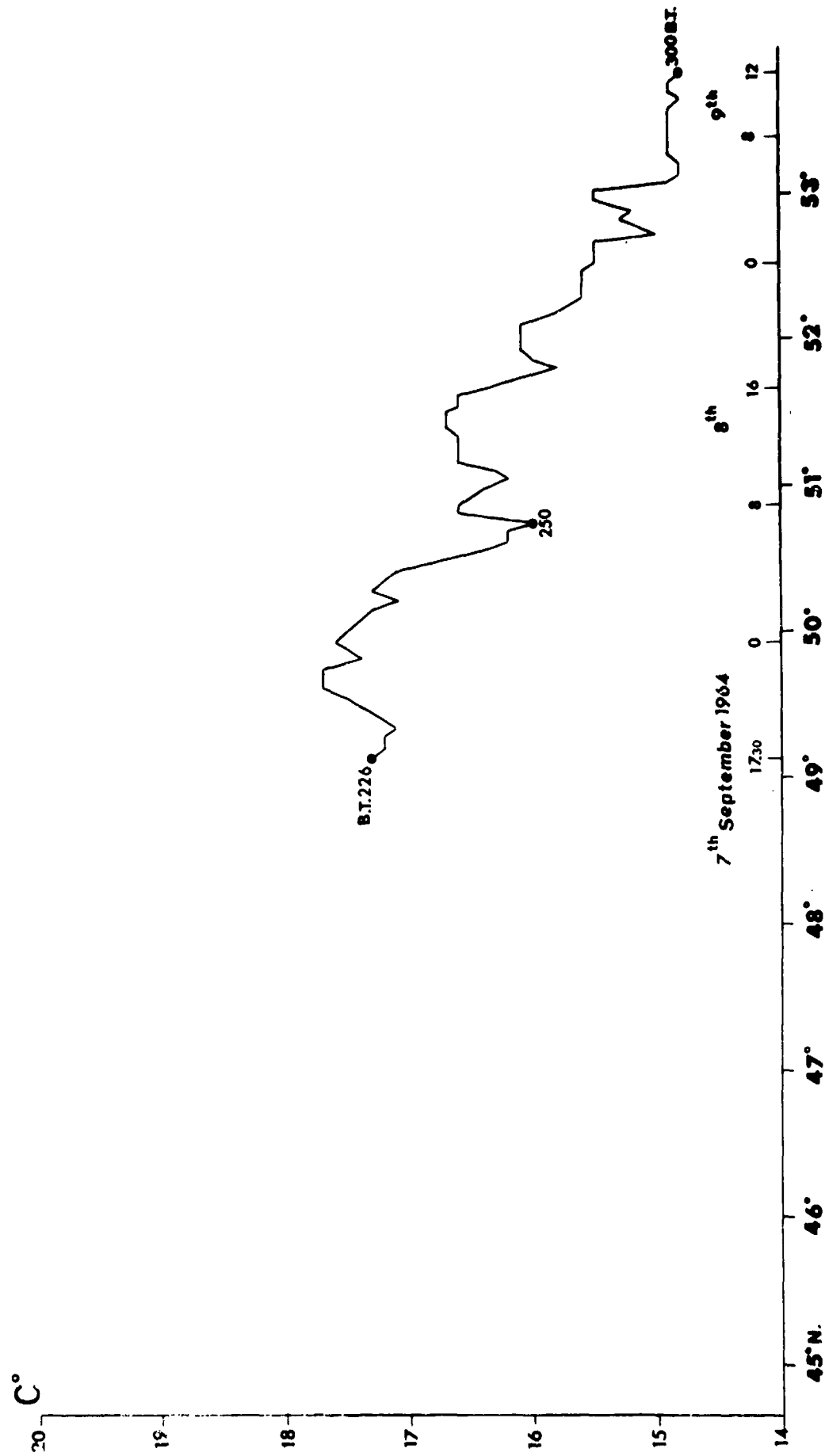


FIG. 2.8

MILOC 64

Phase A, lap 3
Sea Surface Temperature

H.U. Sverdrup

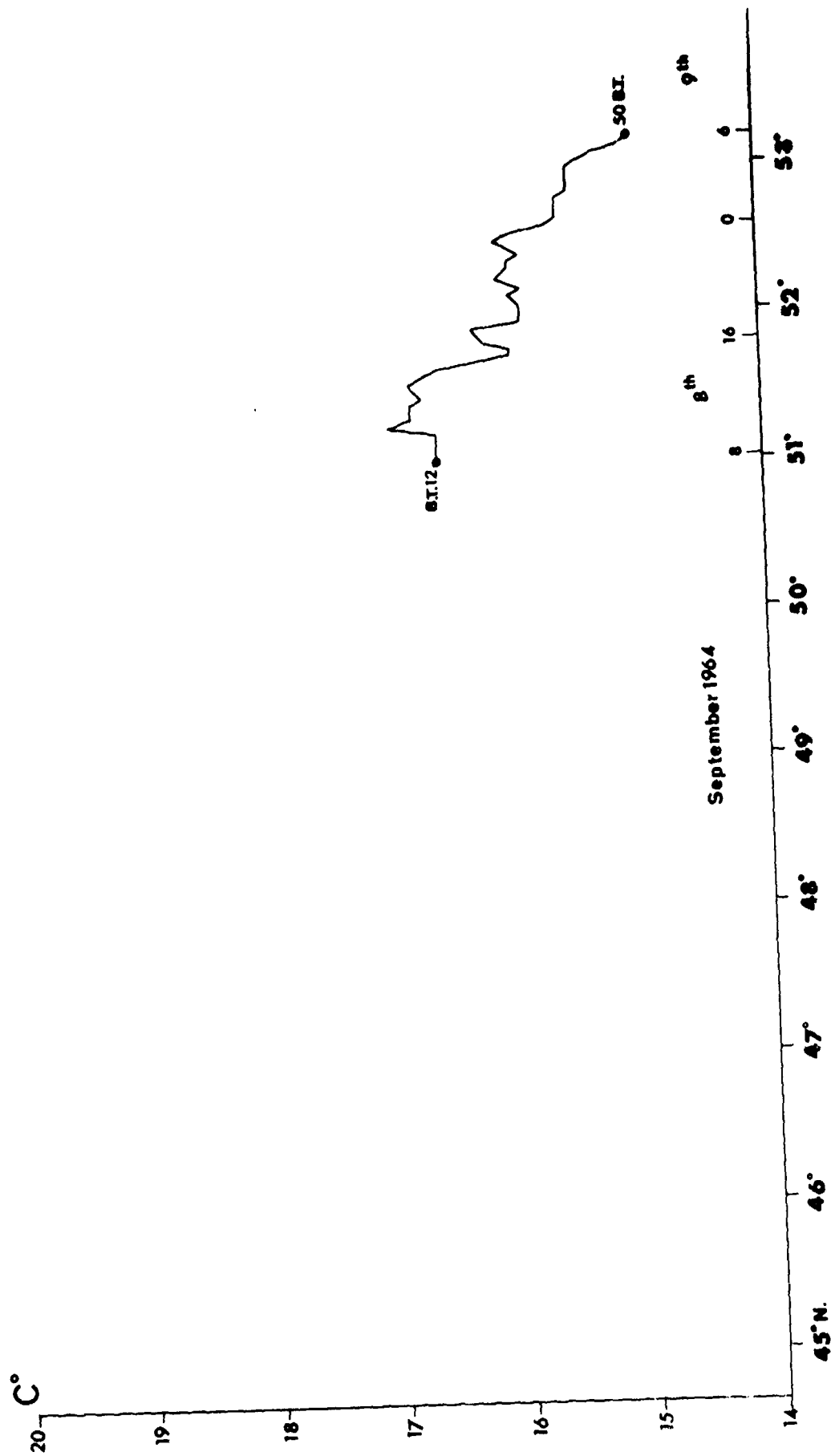


FIG. 2.9

MILOC 64

Phase A, lap 4

Sea Surface Temperature

João de Lisboa

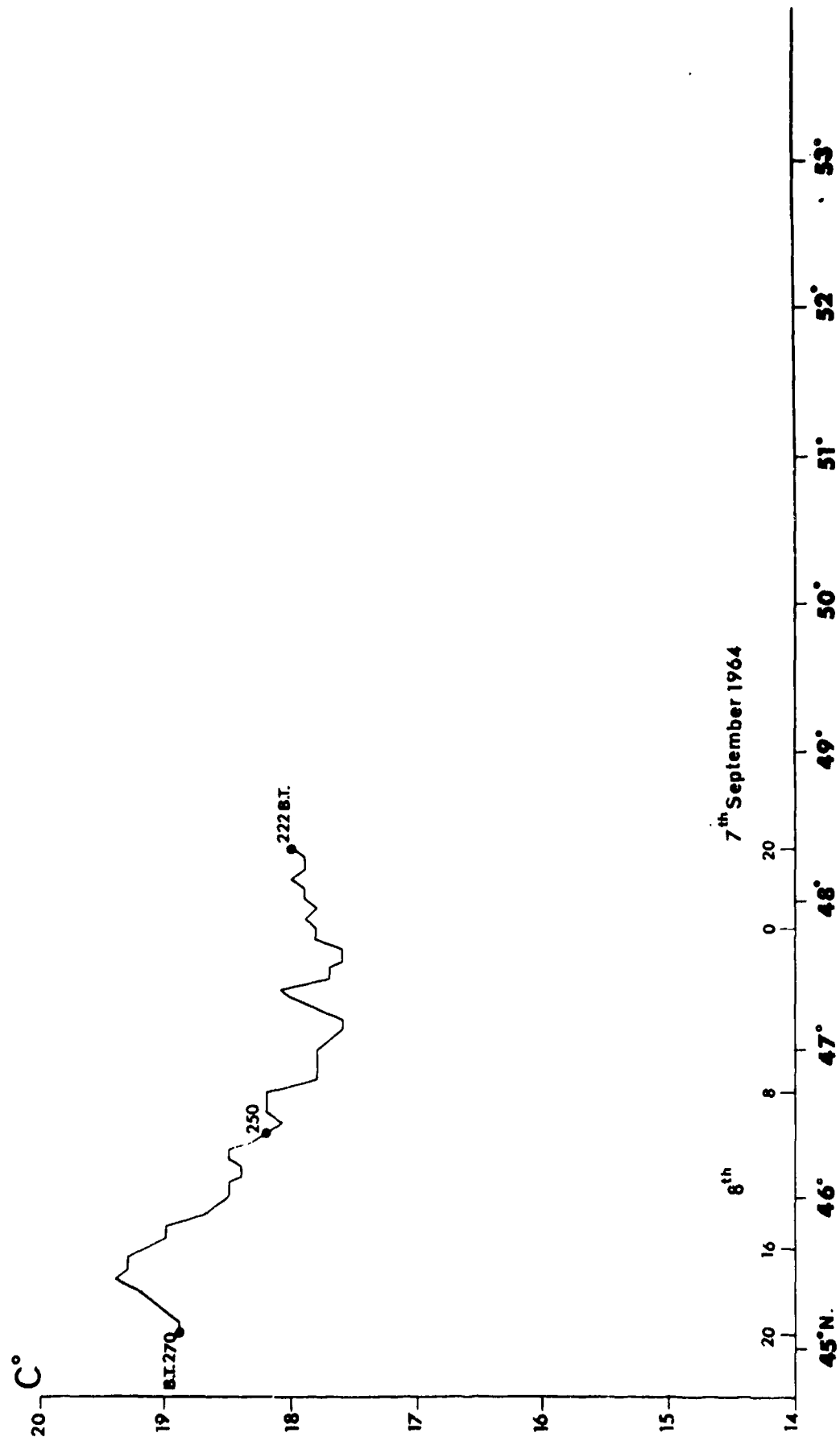


FIG. 2.10

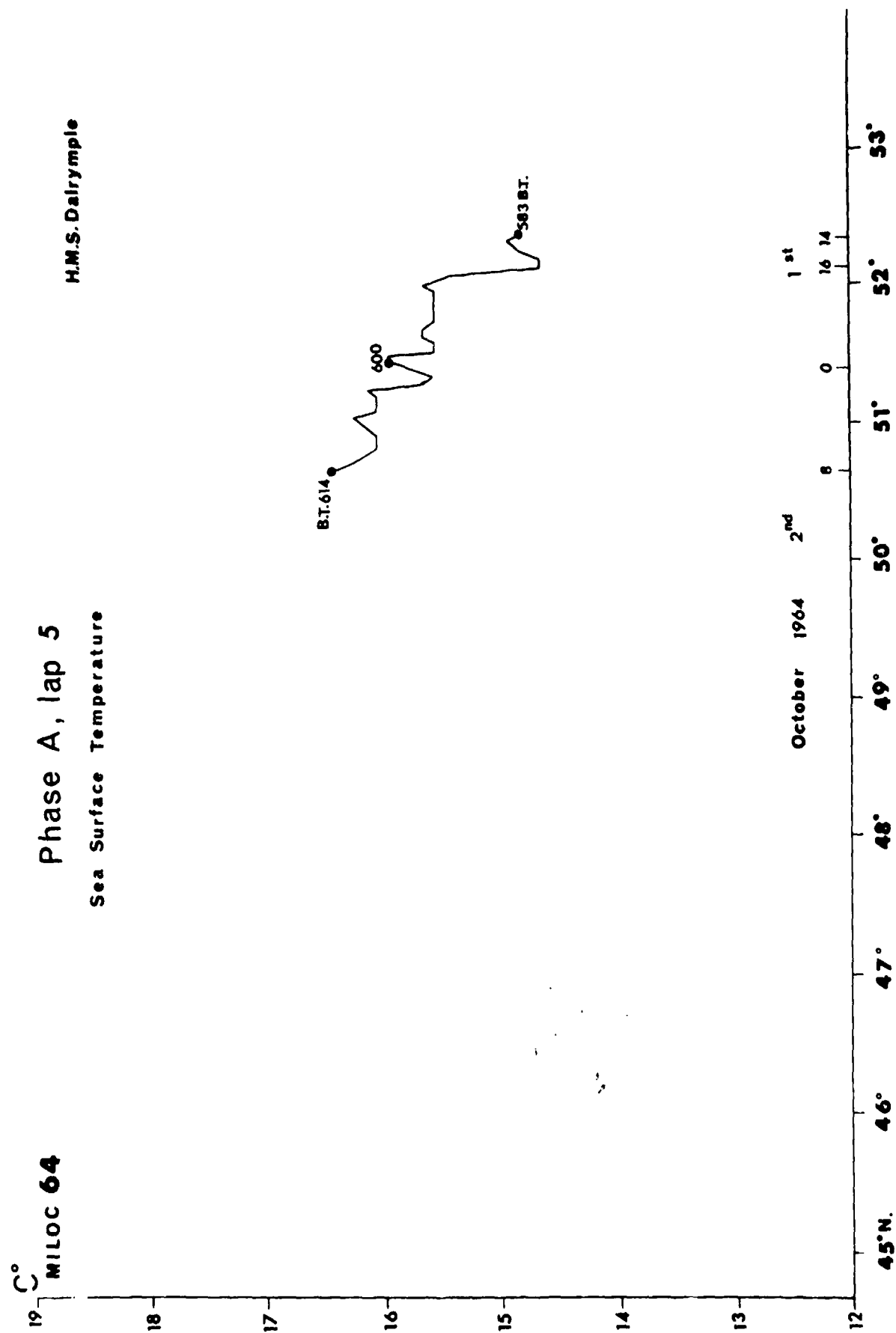


FIG. 2.11

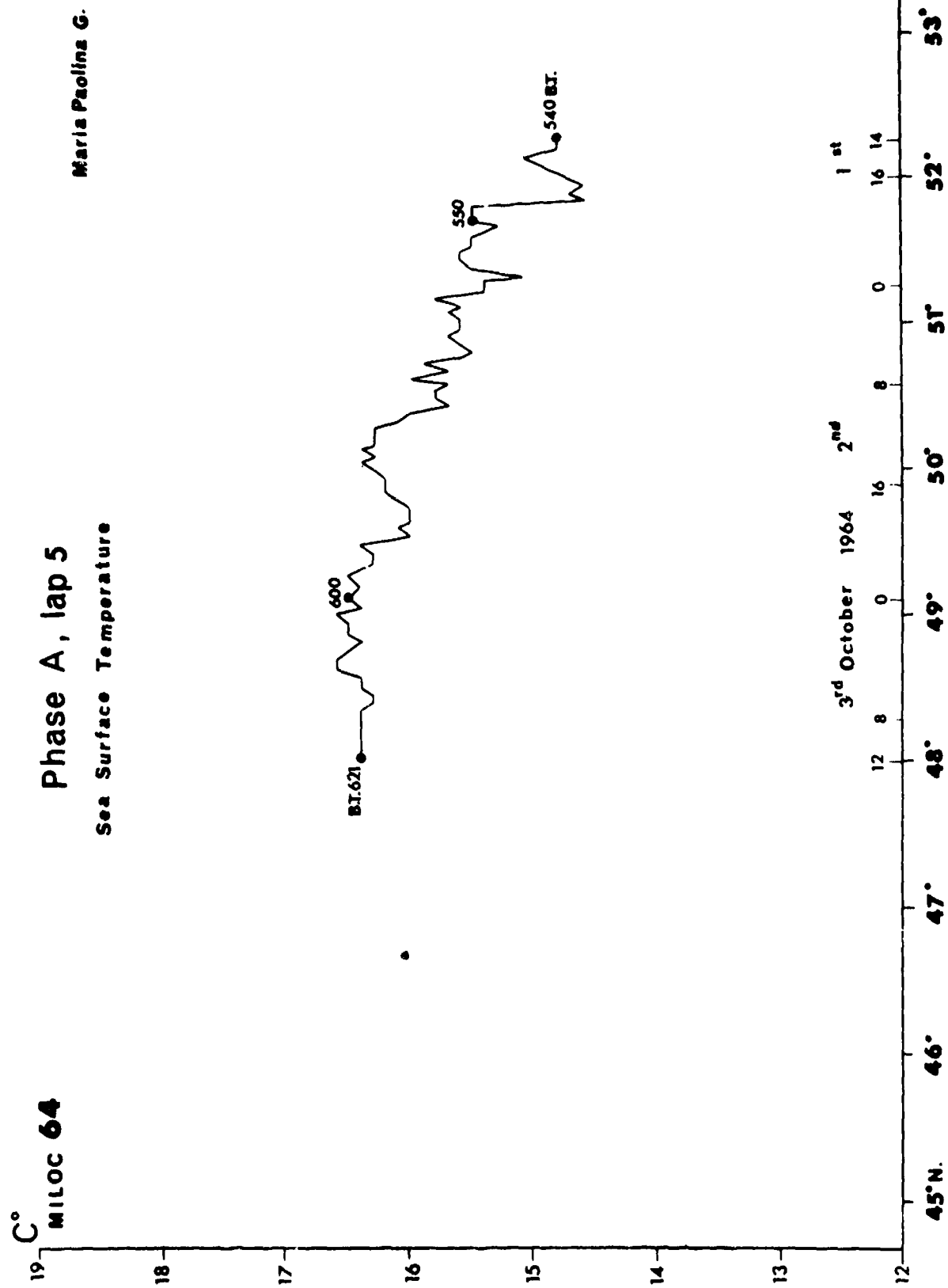


FIG. 2.12

MILOC 64

Phase A, lap 1

H.M.S. Dalrymple

DIFFERENCE: INJECTION TEMPERATURE MINUS S.S.T.
(Injection Temperature extracted from Thermograph Trace)

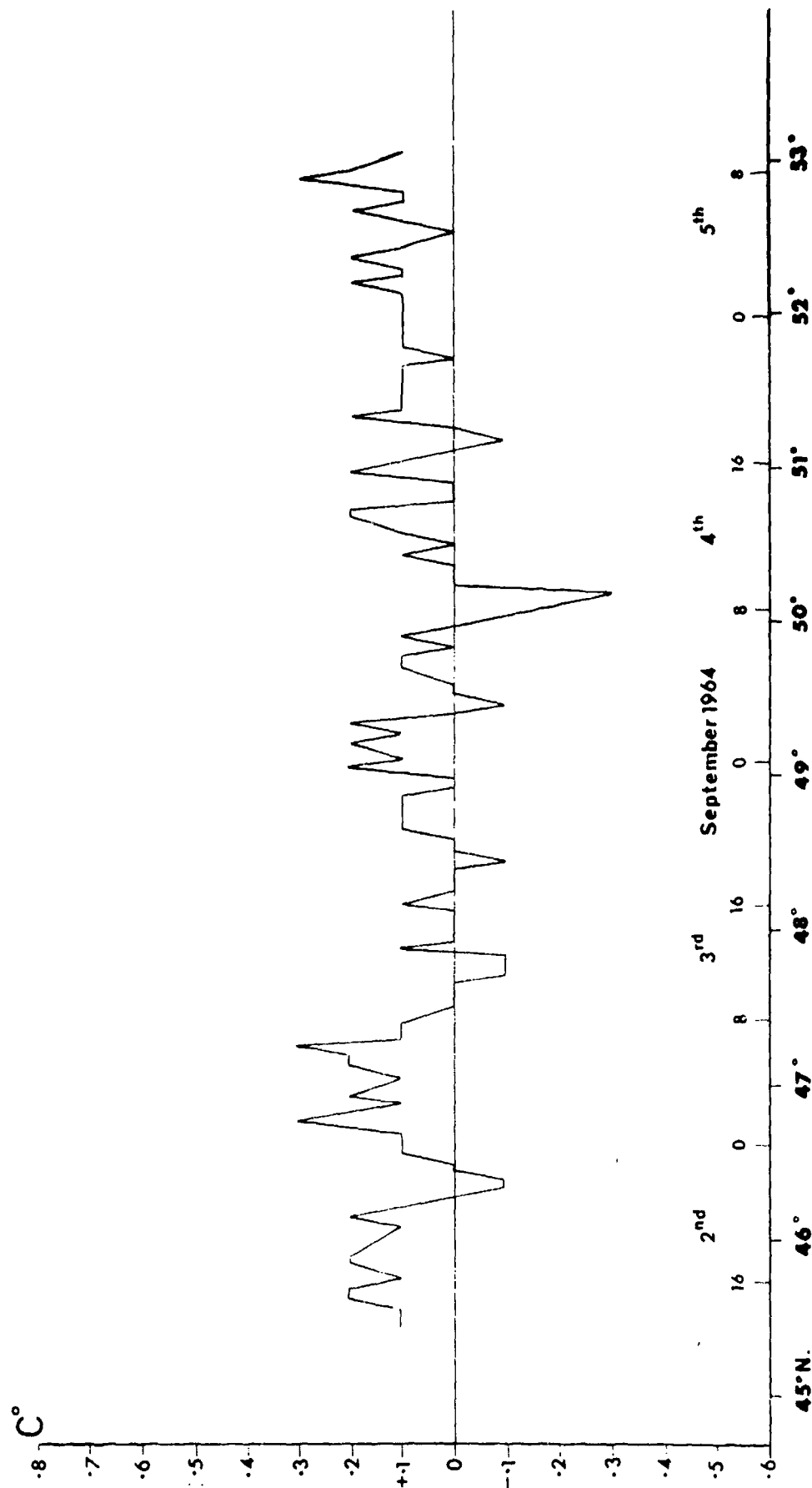


FIG. 2.13

MILOC 64

Phase A, lap 2

H.M.S. Dairymple

DIFFERENCE: INJECTION TEMPERATURE MINUS S.S.T.
(Injection Temperature extracted from Thermograph Trace)

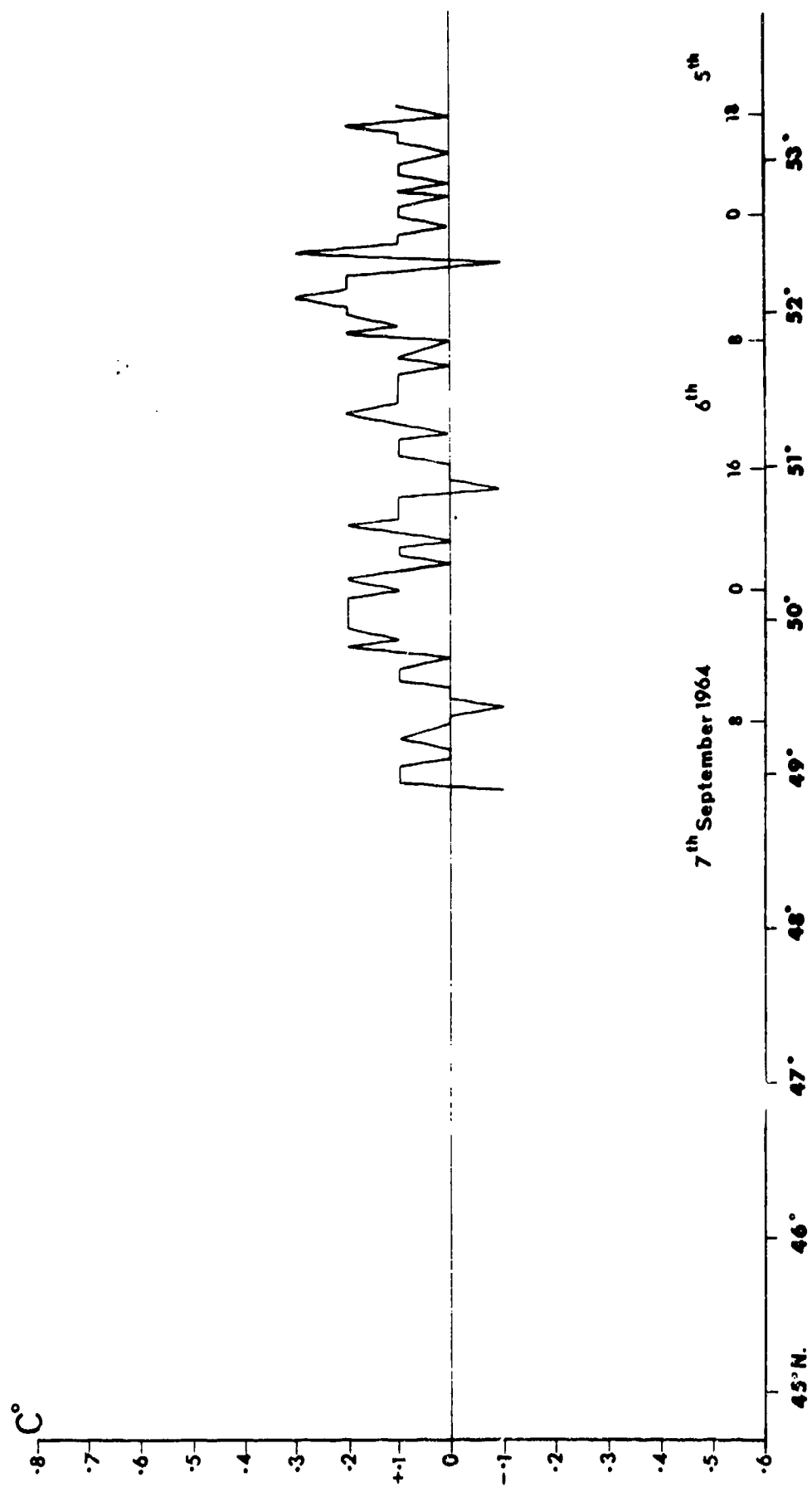


FIG. 2.14

MILOC 64

Phase A, lap 3

H.M.S. Dalrymple

DIFFERENCE: INJECTION TEMPERATURE MINUS S.S.T.
(Injection Temperature extracted from Thermograph Trace)

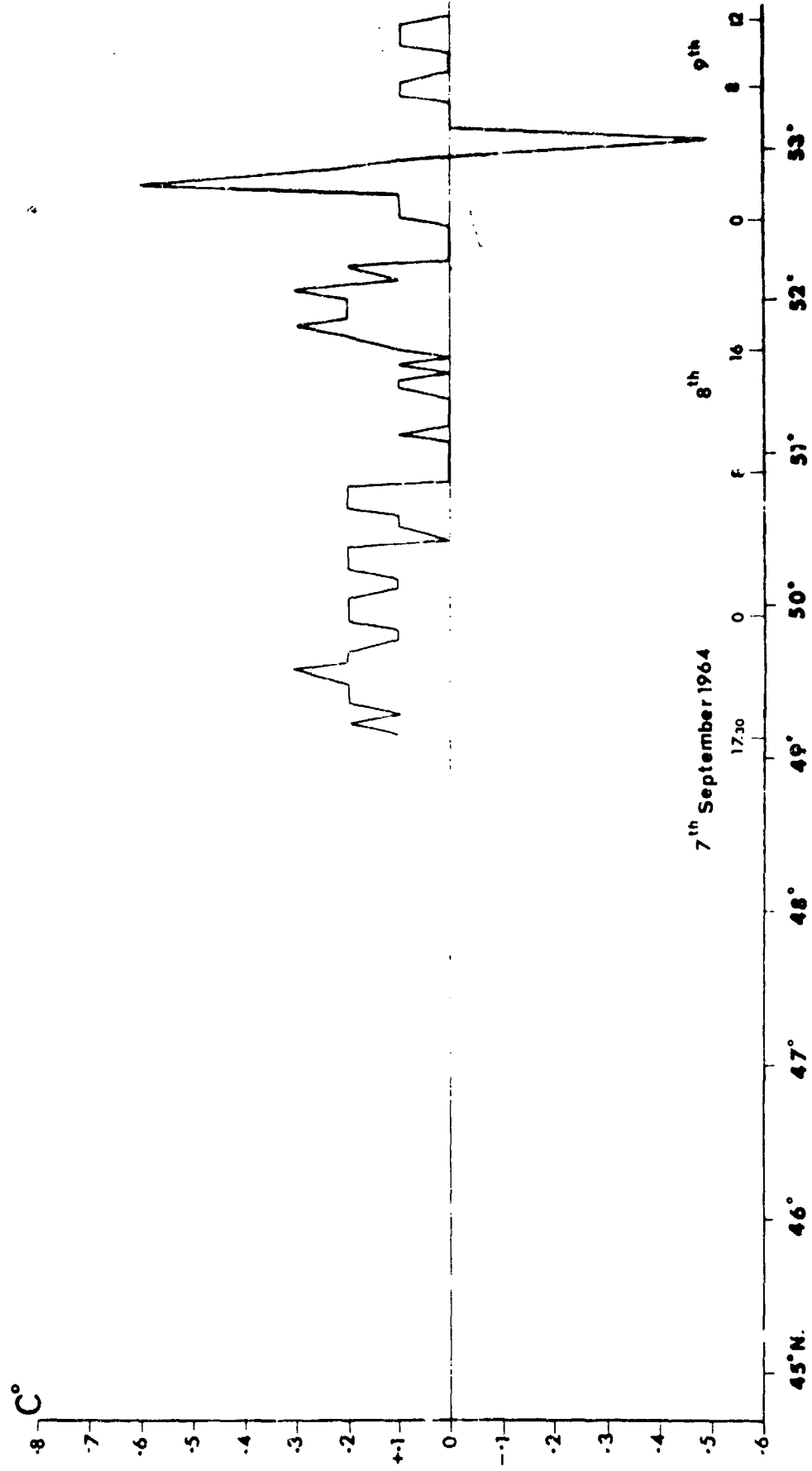


FIG. 2.15

MILOC 64

Phase A, lap 5

H.M.S. Dairymple

DIFFERENCE: INJECTION TEMPERATURE MINUS S.S.T.
(Injection Temperature extracted from Thermograph Trace)

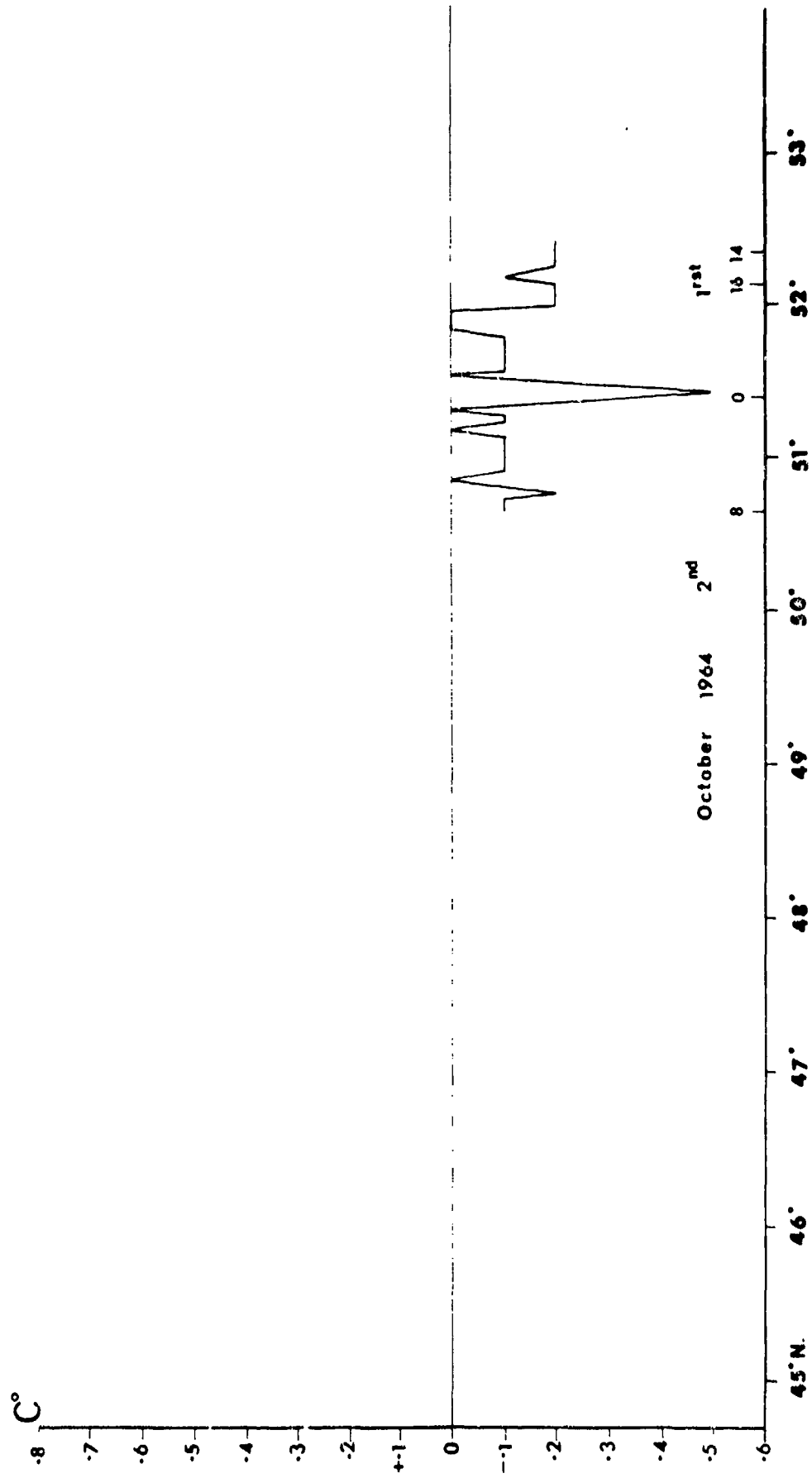


FIG. 2.16

MILO: 64

Phase A, lap 1

João de Lisboa

DIFFERENCE: INJECTION TEMPERATURE MINUS S.S.T.

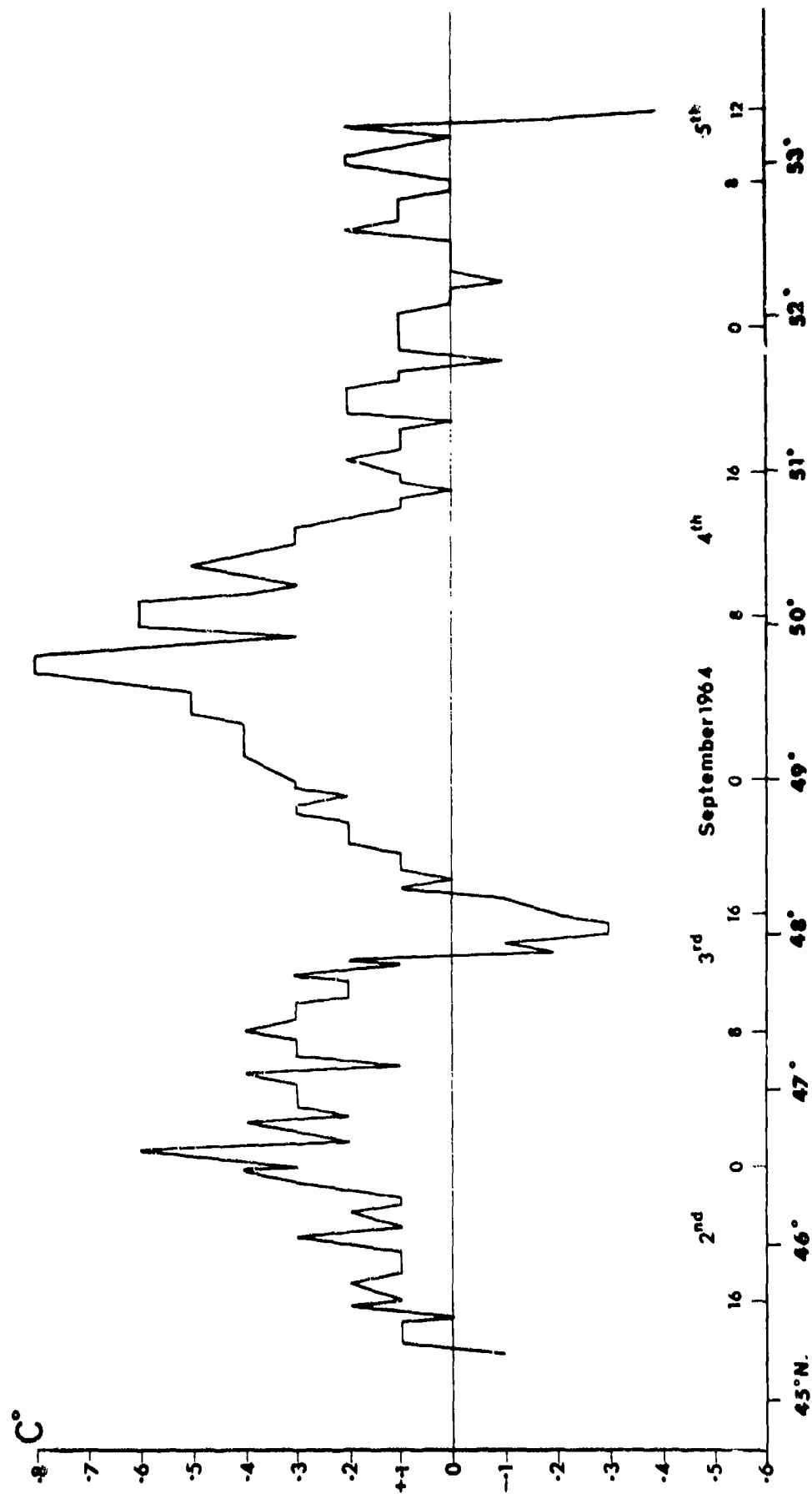
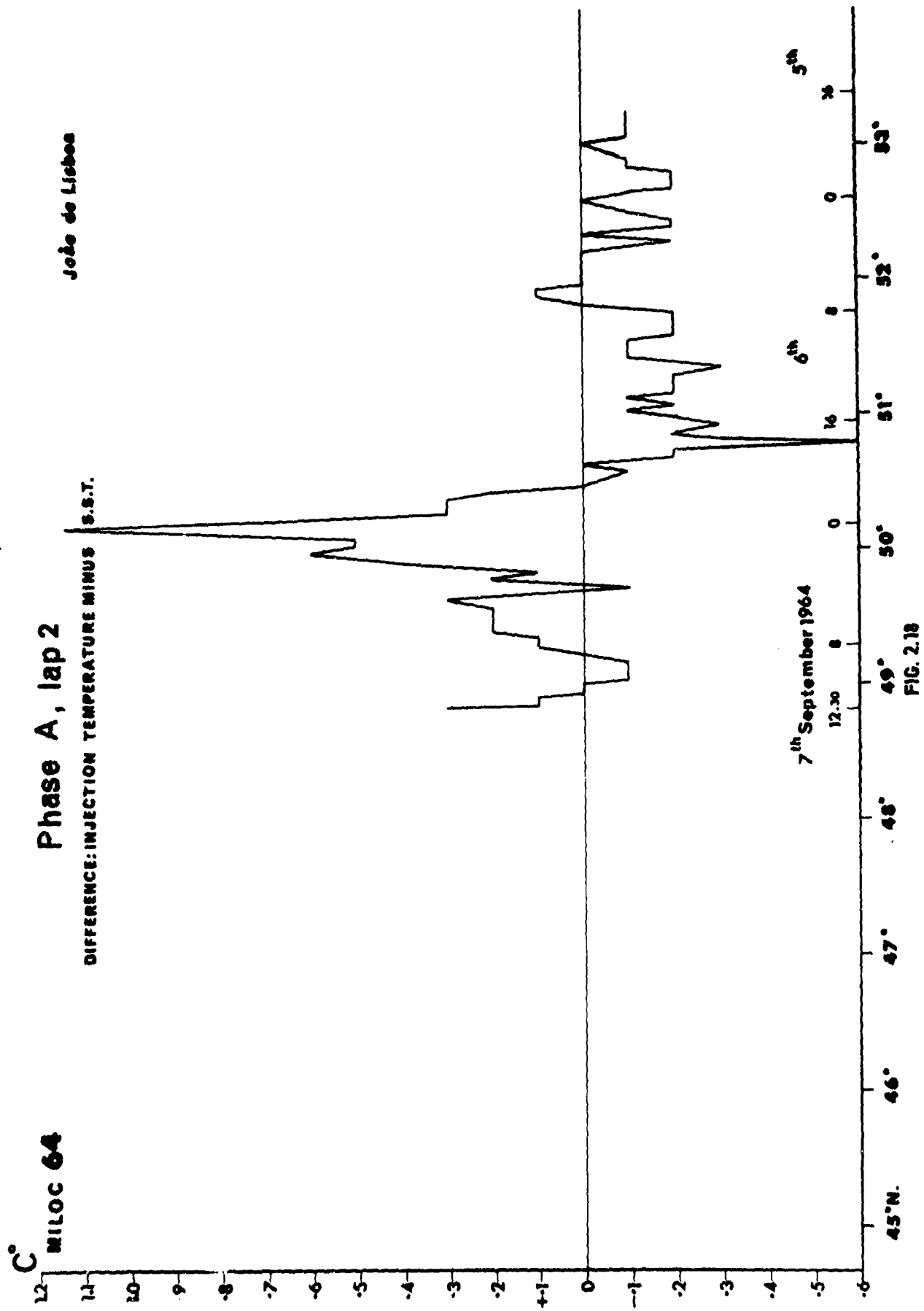


FIG. 2.17



MILOC 64

Phase A, lap 4

João de Lisboa

DIFFERENCE: INJECTION TEMPERATURE MINUS S.S.T.

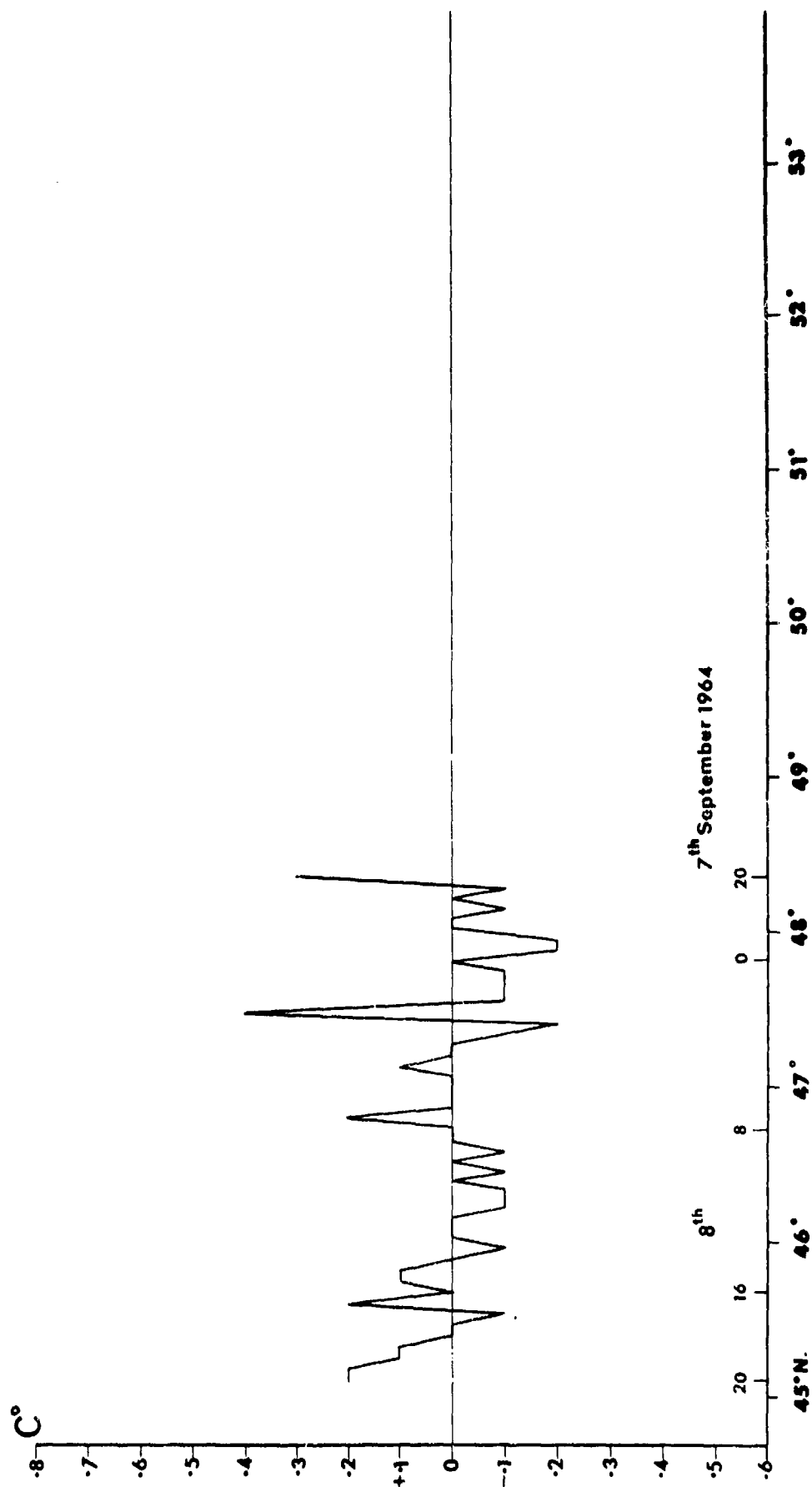


FIG. 2.19

MILOC 64

Phase A, lap 3

H.U. Sverdrup

DIFFERENCE: INJECTION TEMPERATURE MINUS S.S.T.
(Injection Temperature extracted from Thermograph Trace)

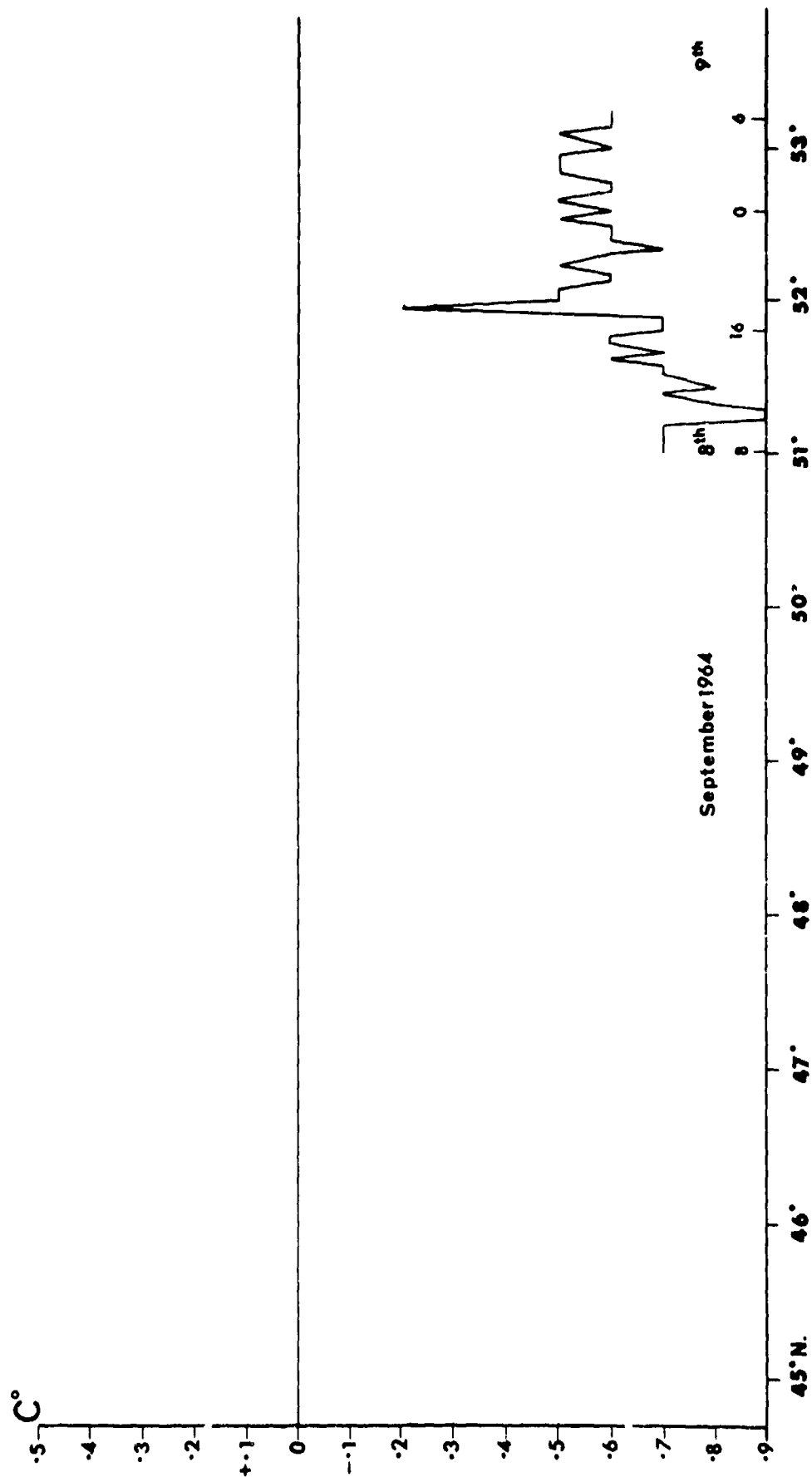


FIG. 2.20

Milloc 64

phase A, lap 1

2nd September 1964

SEA SURFACE TEMPERATURE
(ART and Bucket Comparisons)

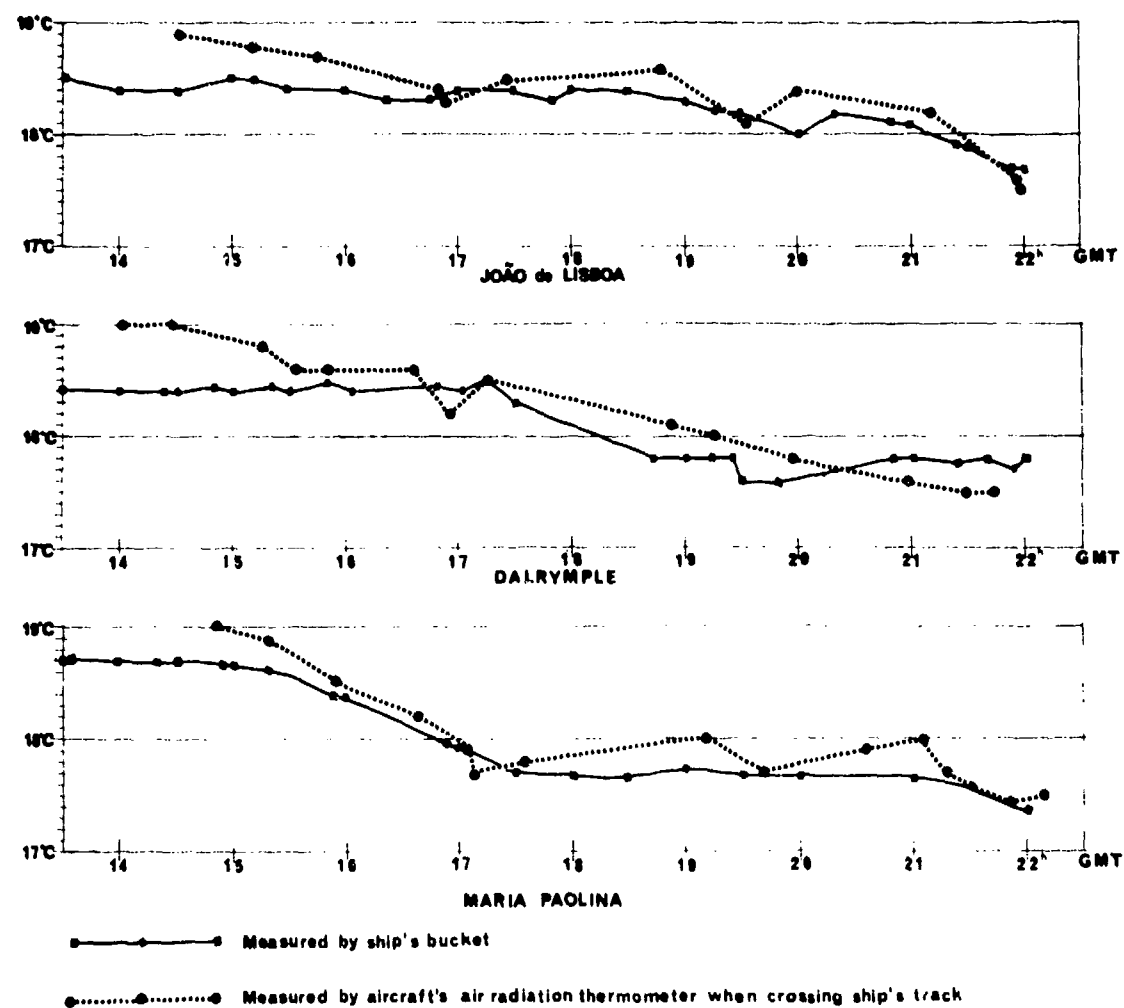


FIG. 2.21

Milloc 64

phase A, lap 1

3rd September 1964

SEA SURFACE TEMPERATURE
(ART and Bucket Comparisons)

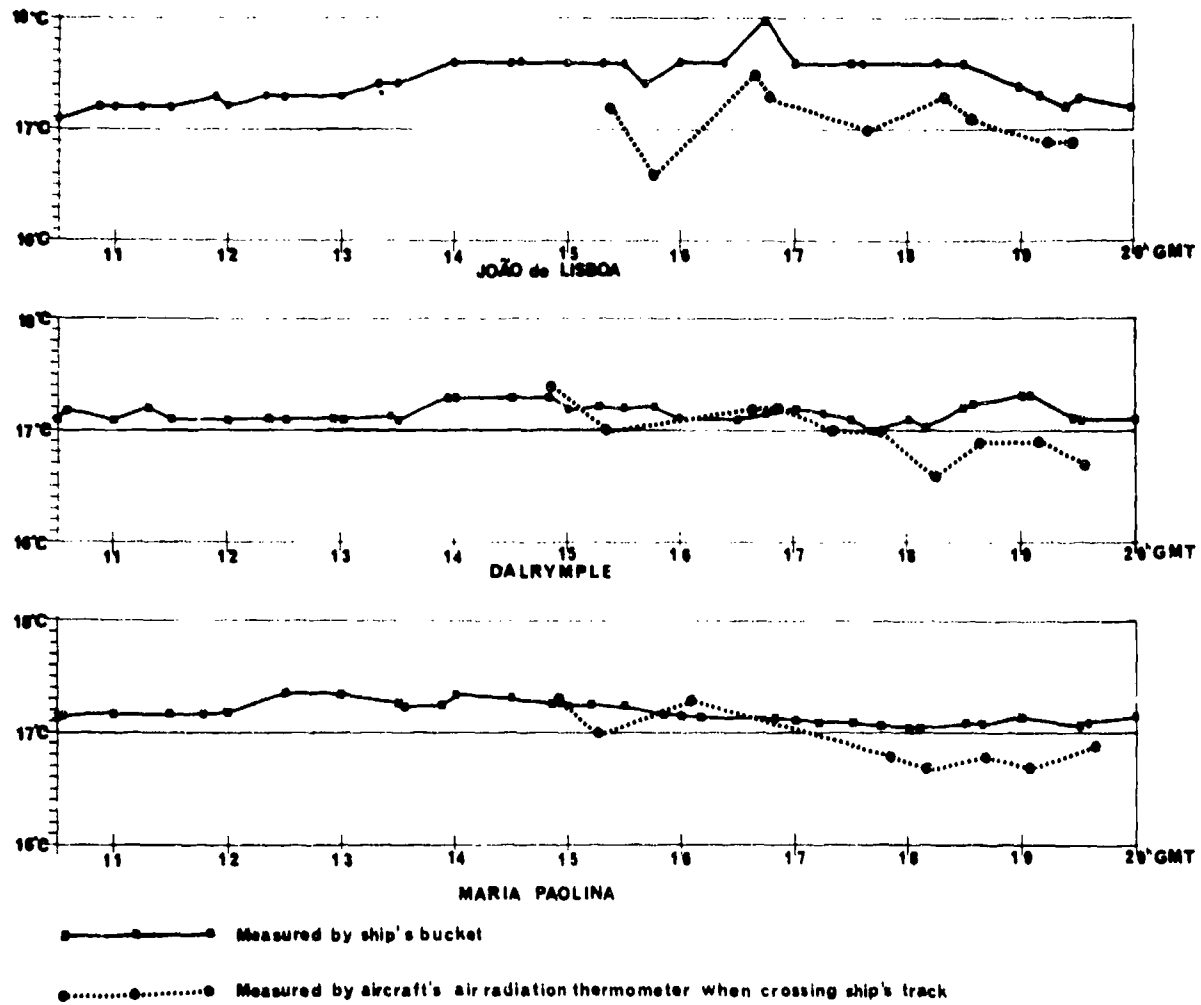


FIG. 2.22

Milloc 64

phase A, lap 1

4th September 1964

SEA SURFACE TEMPERATURE
(ART and Bucket Comparisons)

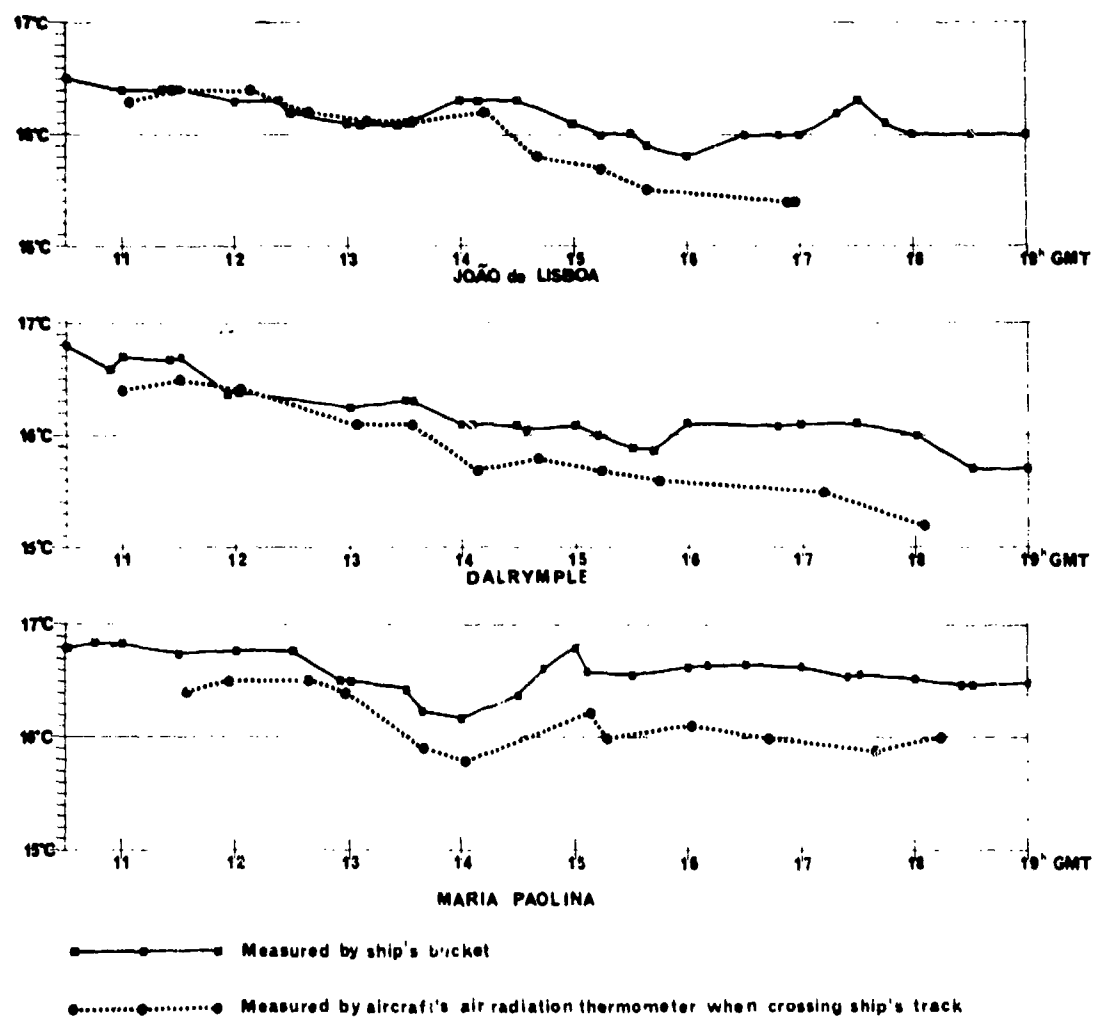


FIG. 2.23

MILOC 64

CLASSIFICATION OF BT TRACES

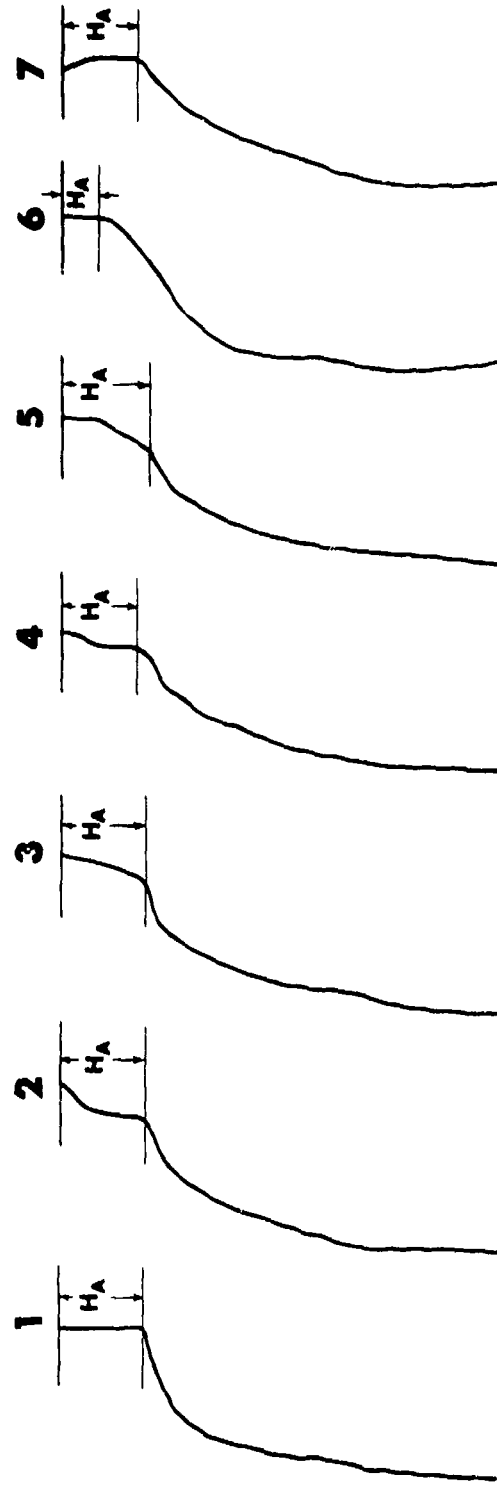


FIG. 3.1

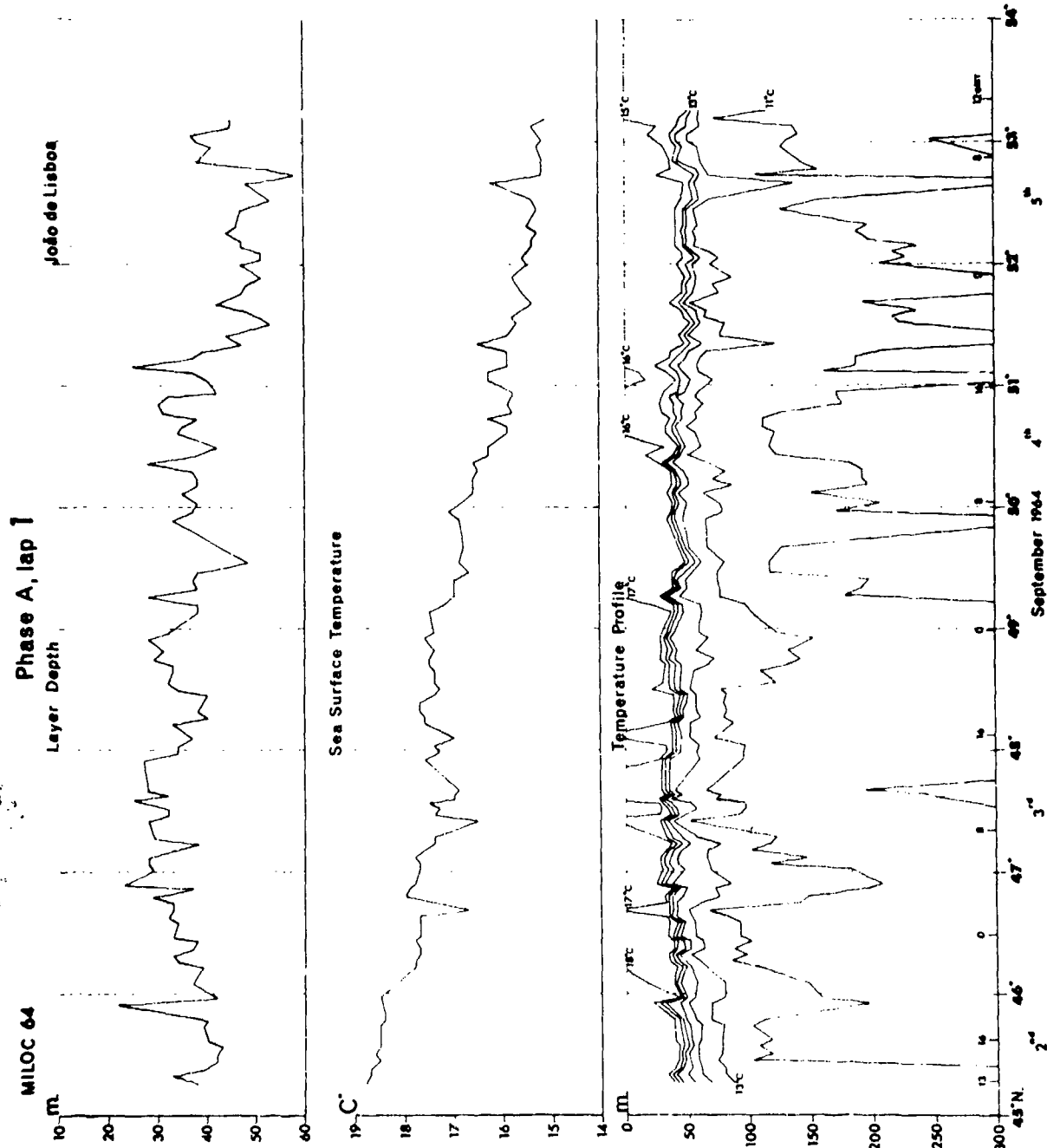


FIG. 3.2

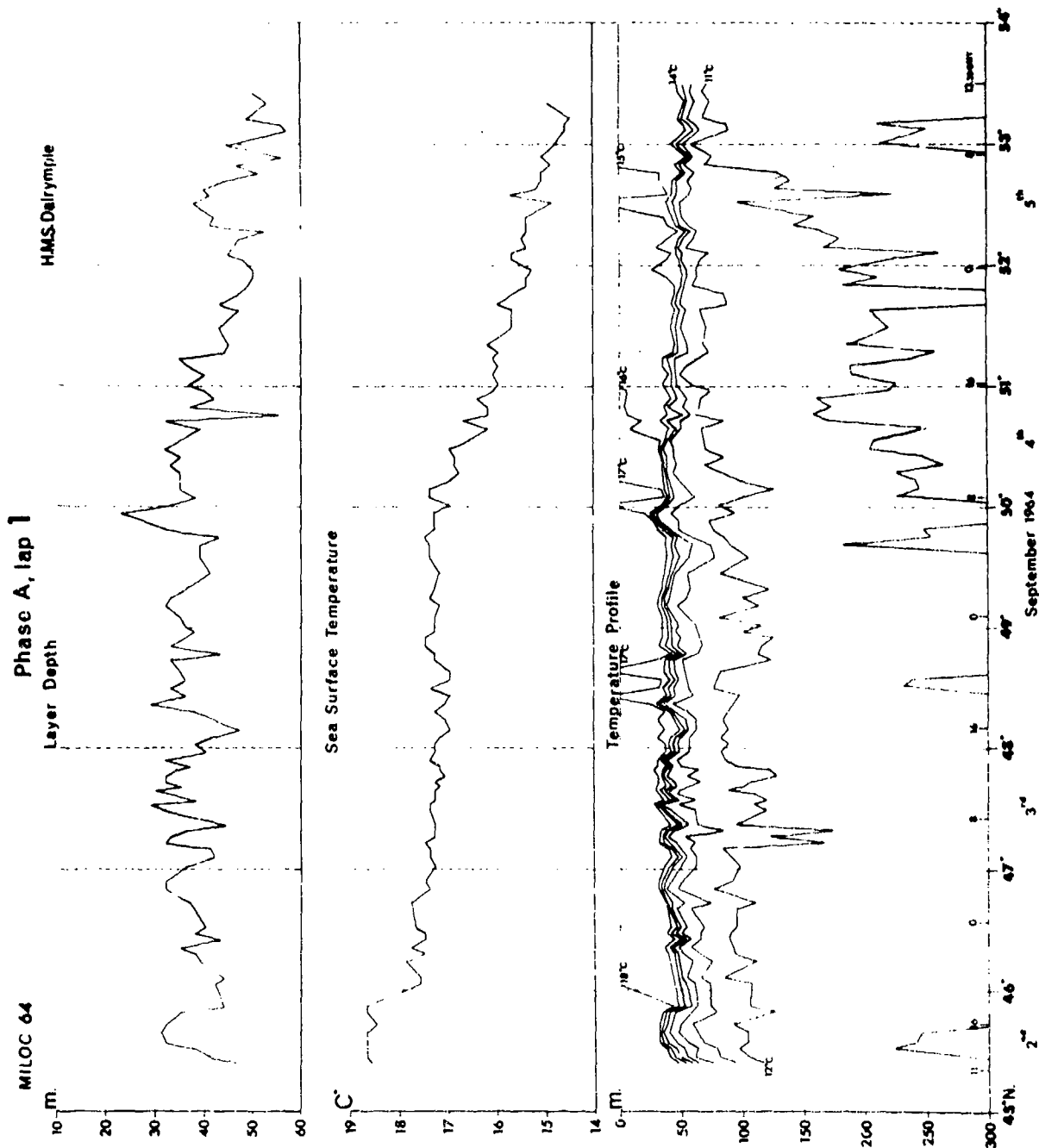


FIG. 3.3

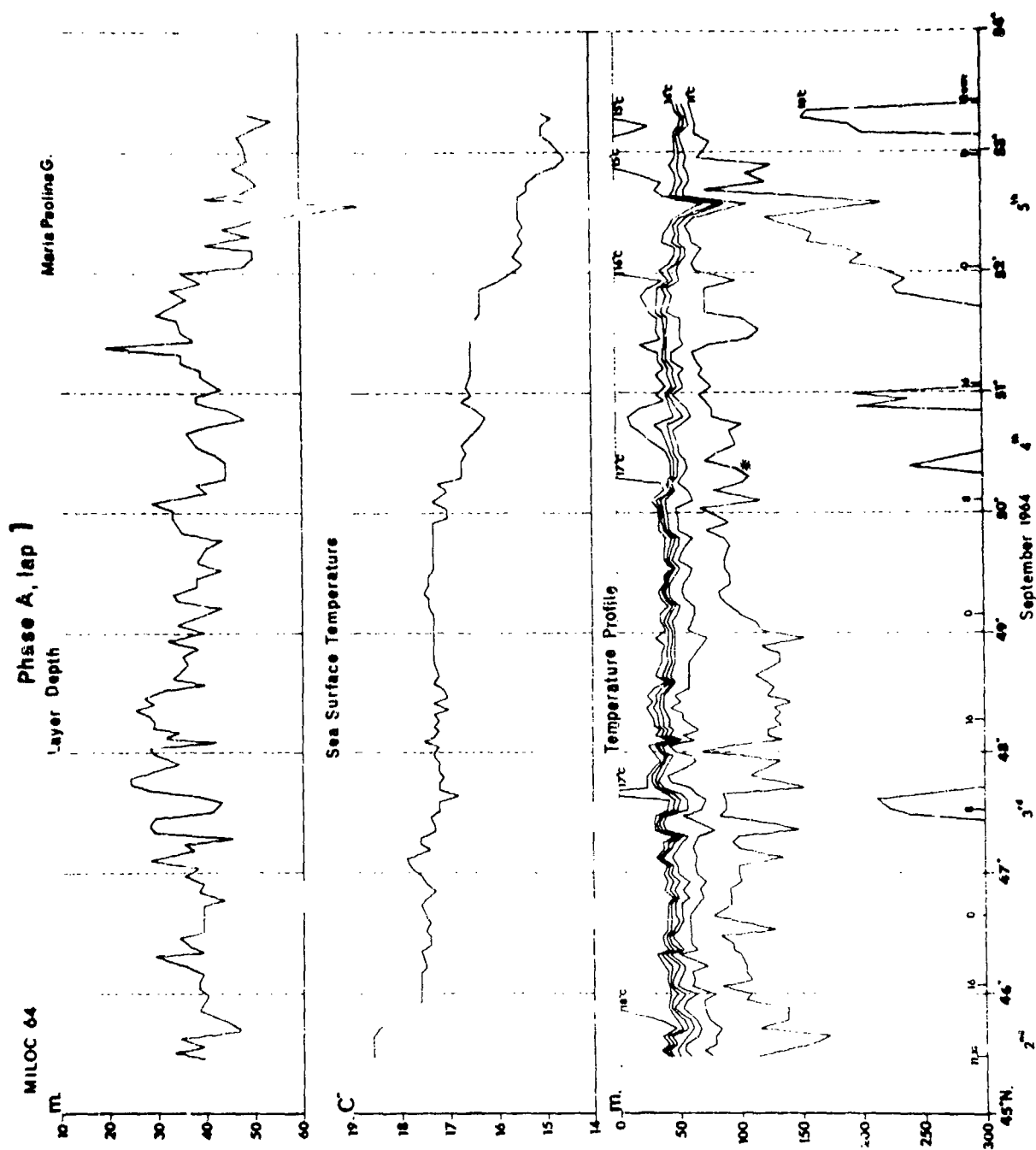


FIG. 3.4

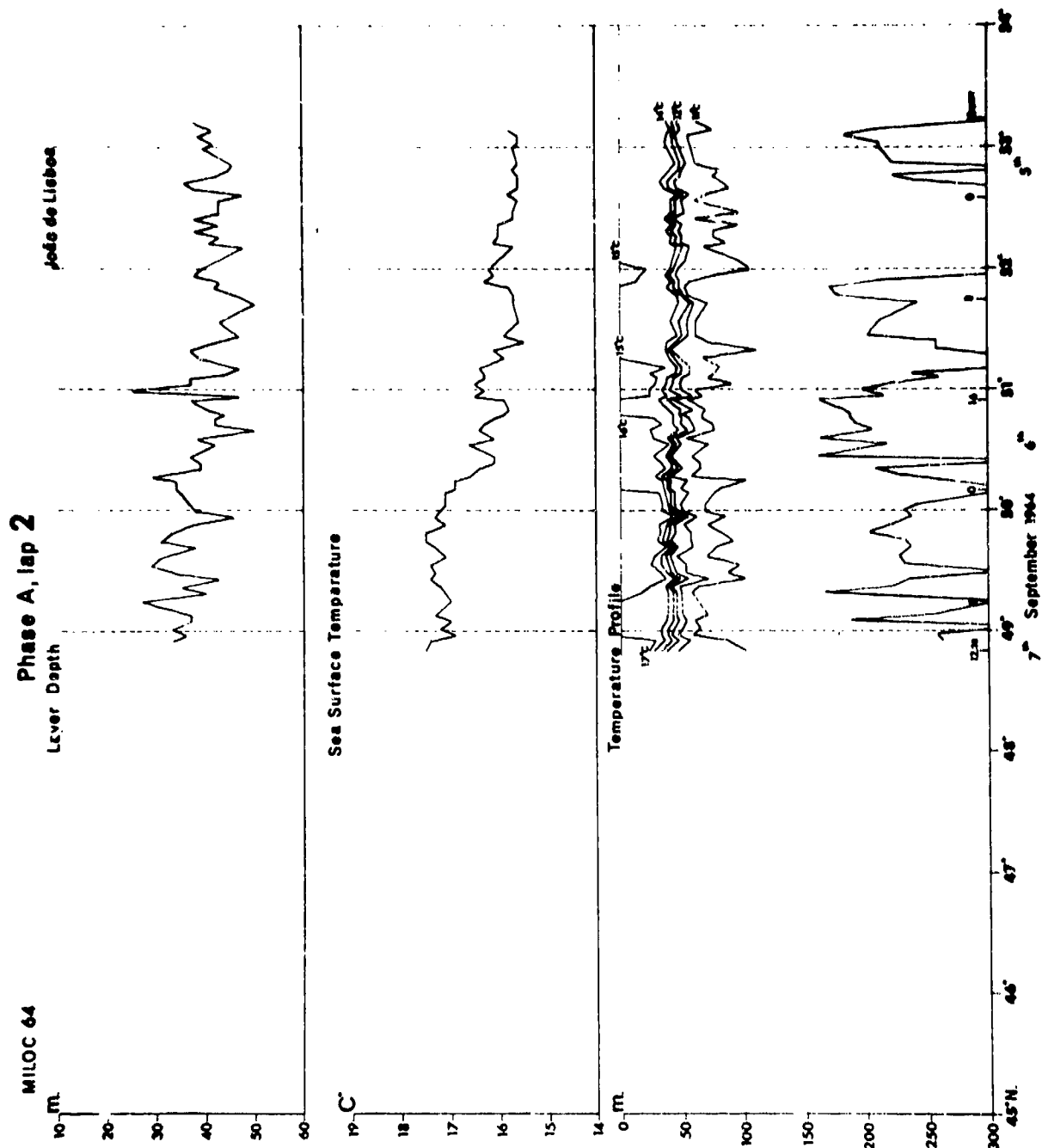


FIG. 3.5

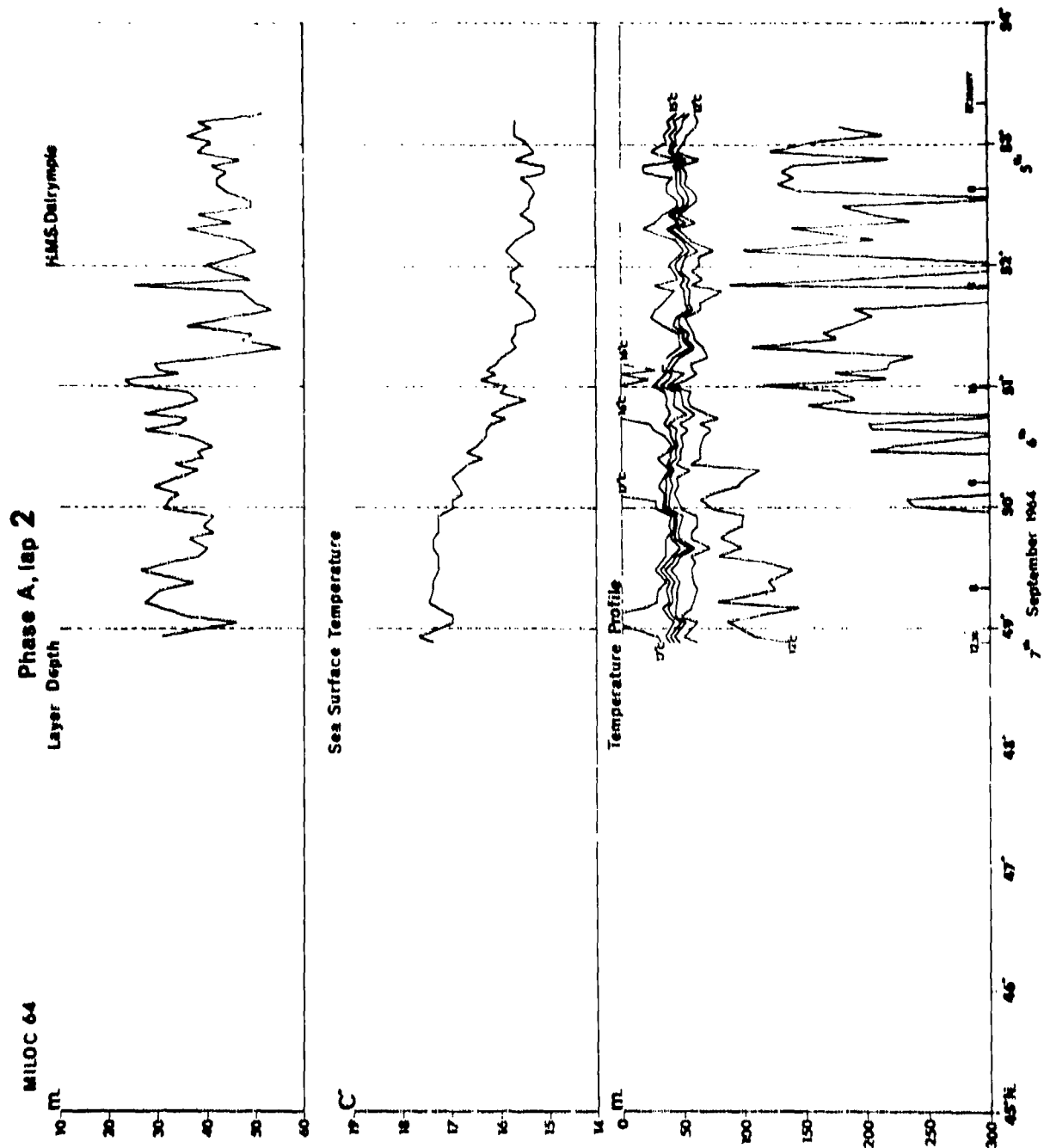


FIG. 3.6

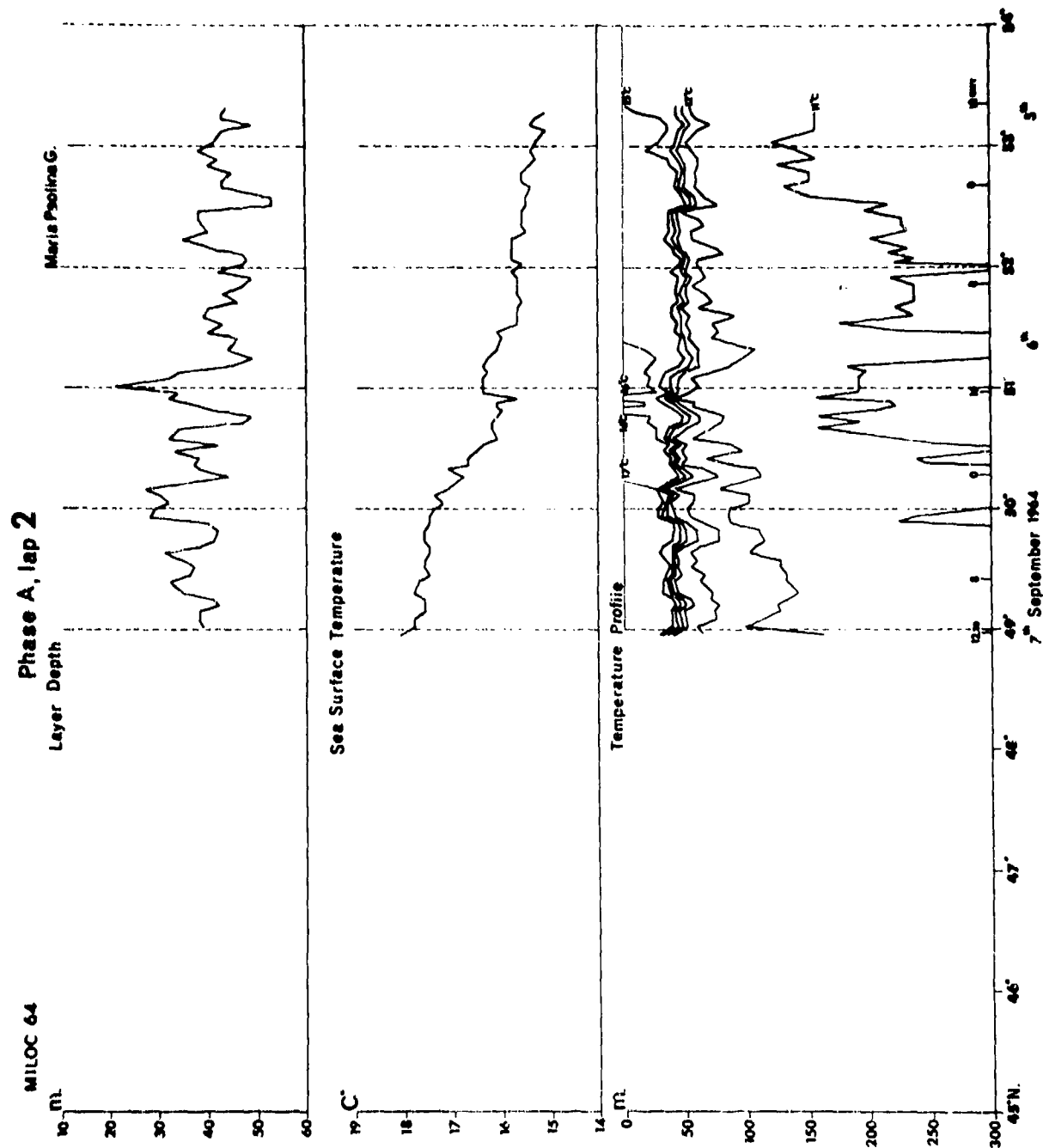


FIG. 3.7

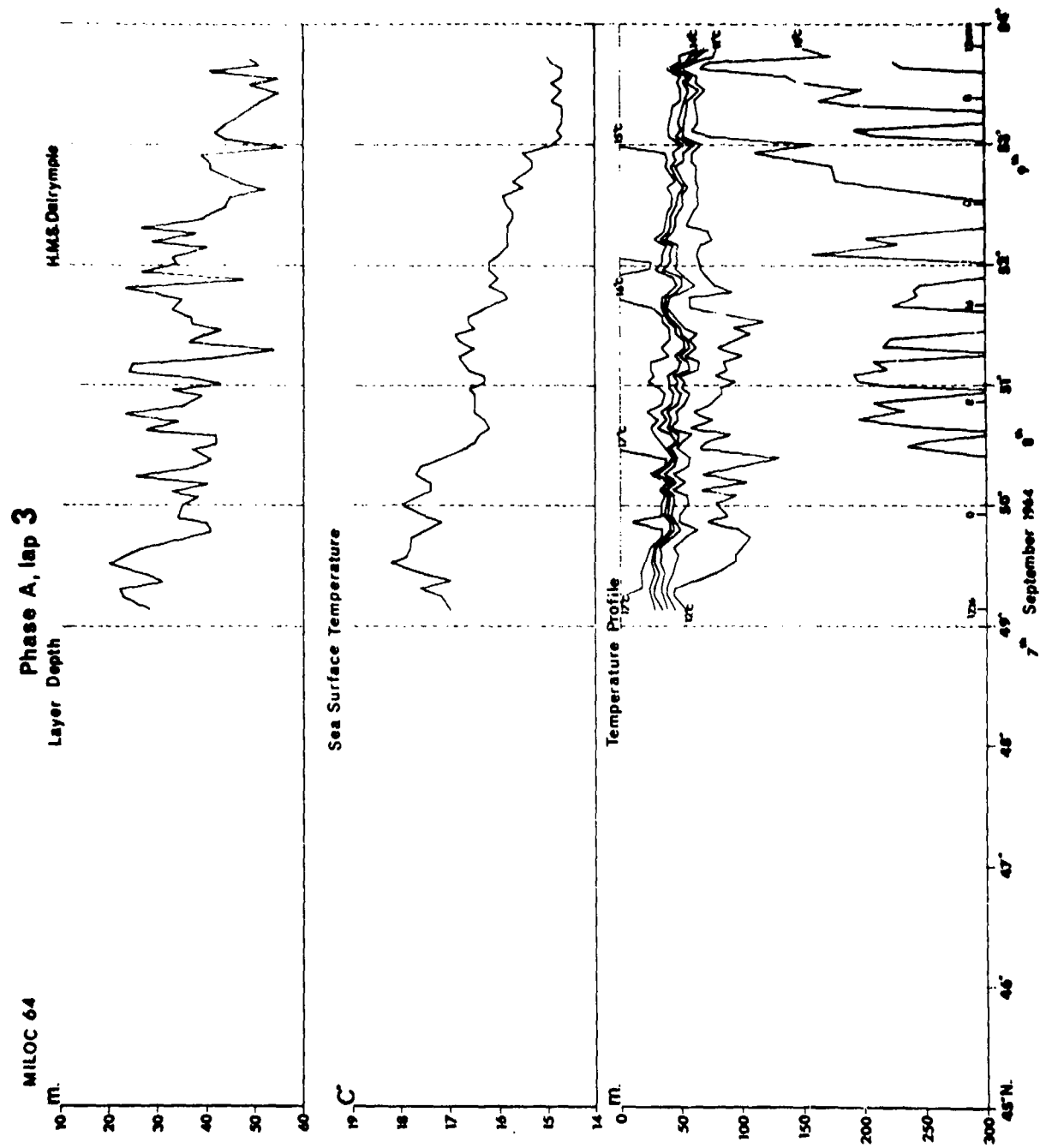


FIG. 3.8

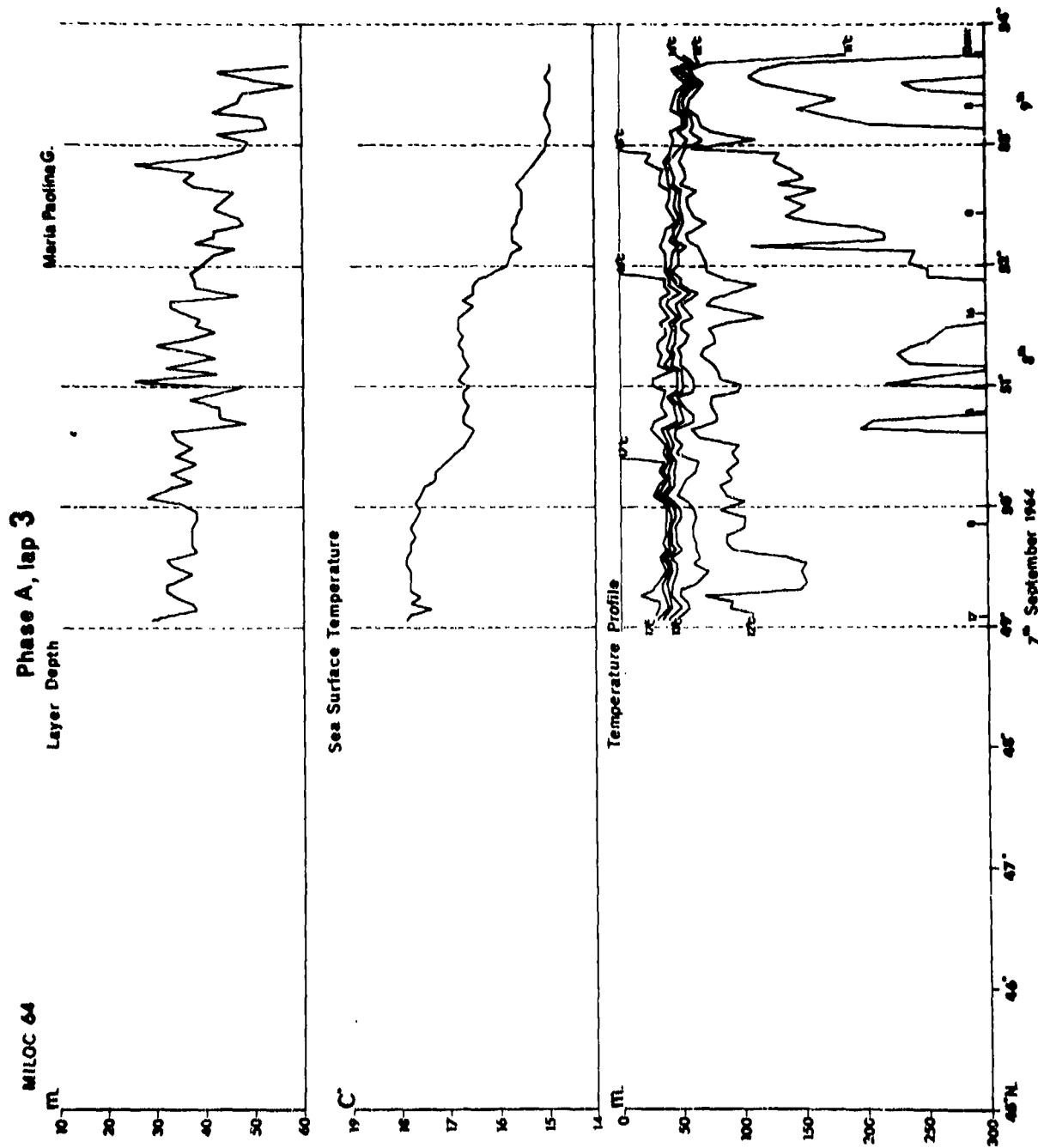


FIG. 3.9

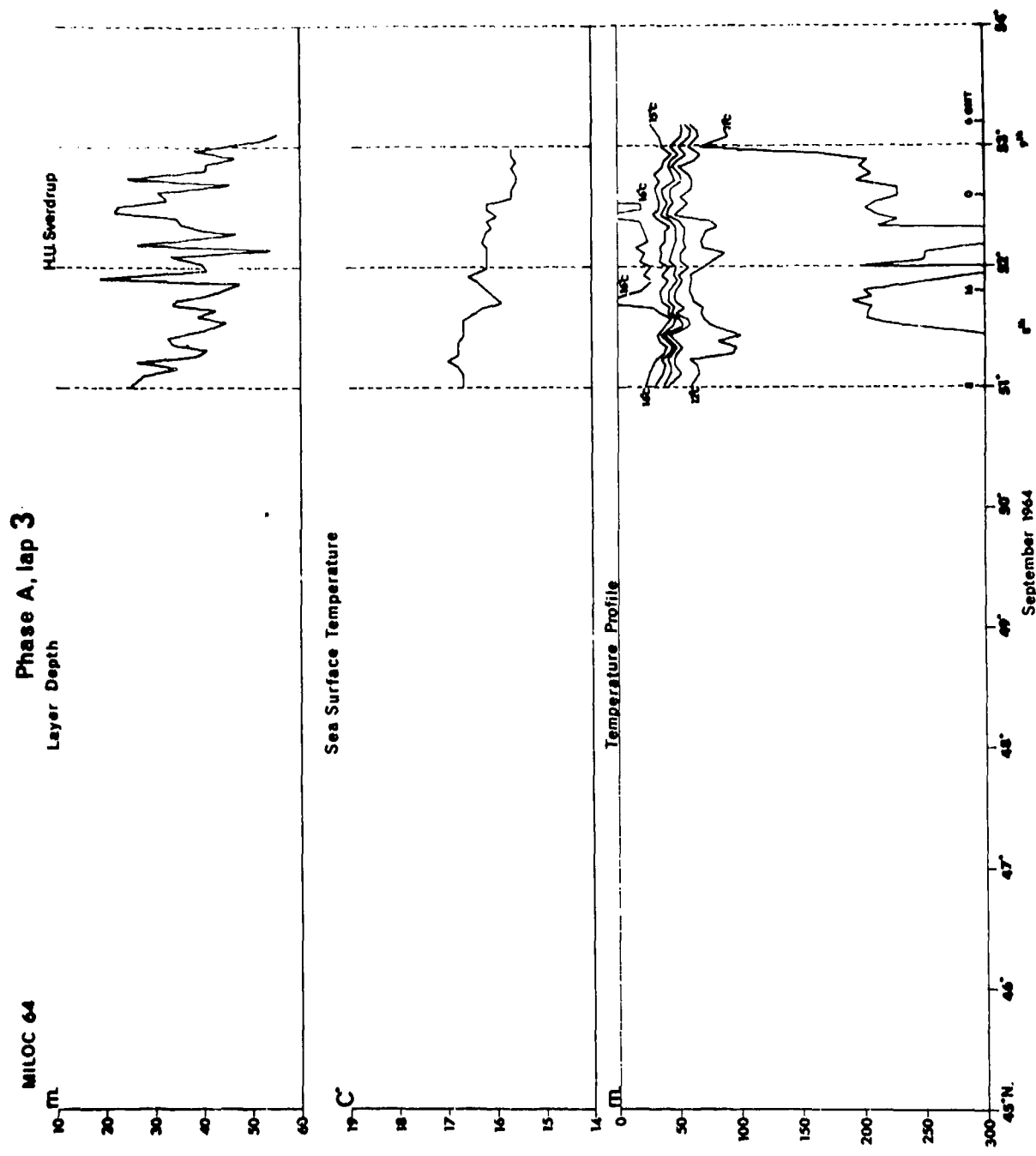


FIG. 3.10

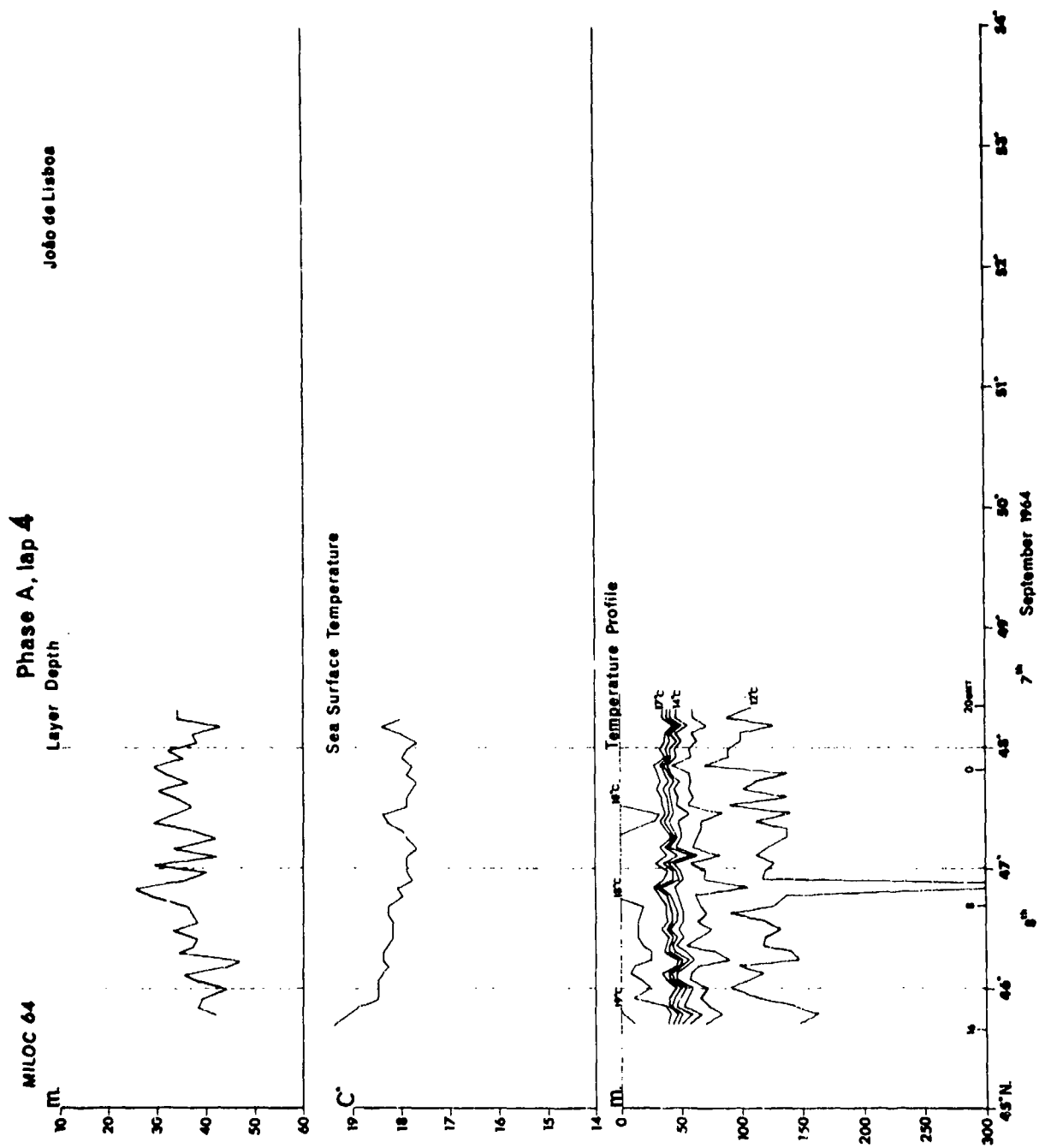


FIG. 3.11

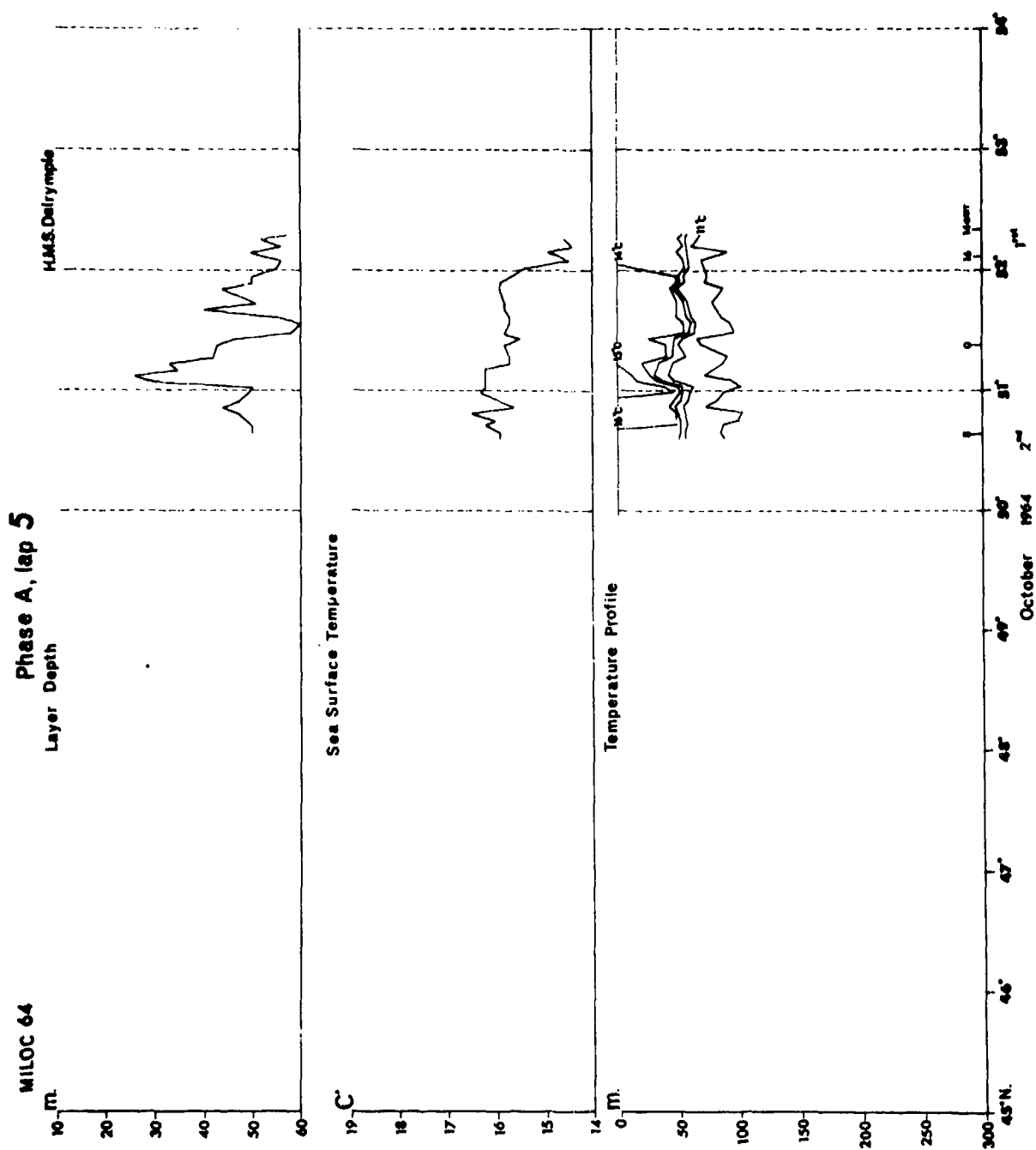


FIG. 3.12

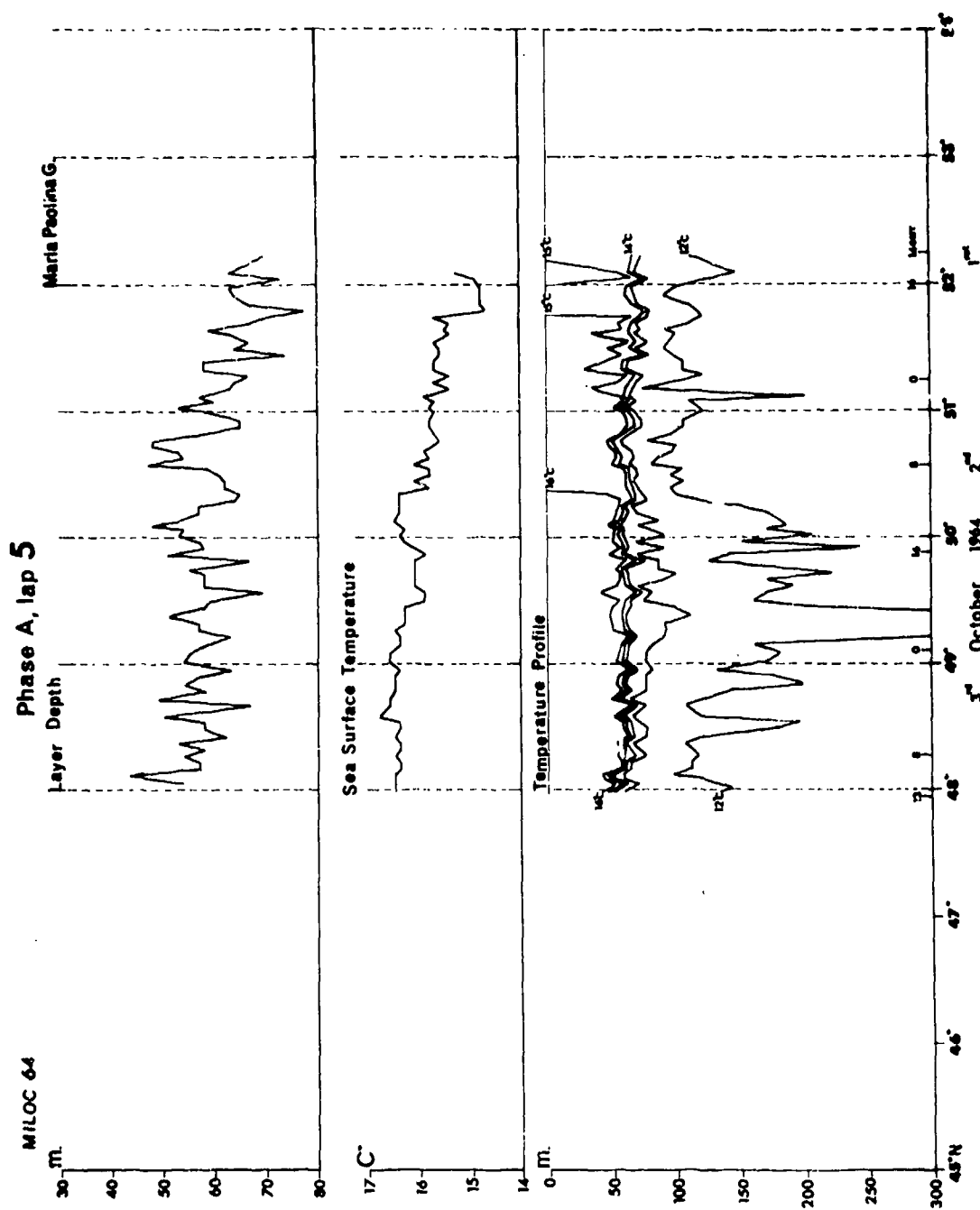


FIG. 3.13

MILOC 64

Phase A, lap 1
LAYER DEPTH AND SEA SURFACE TEMPERATURE
MEASURED SIMULTANEOUSLY ALONG SHIPS TRACKS

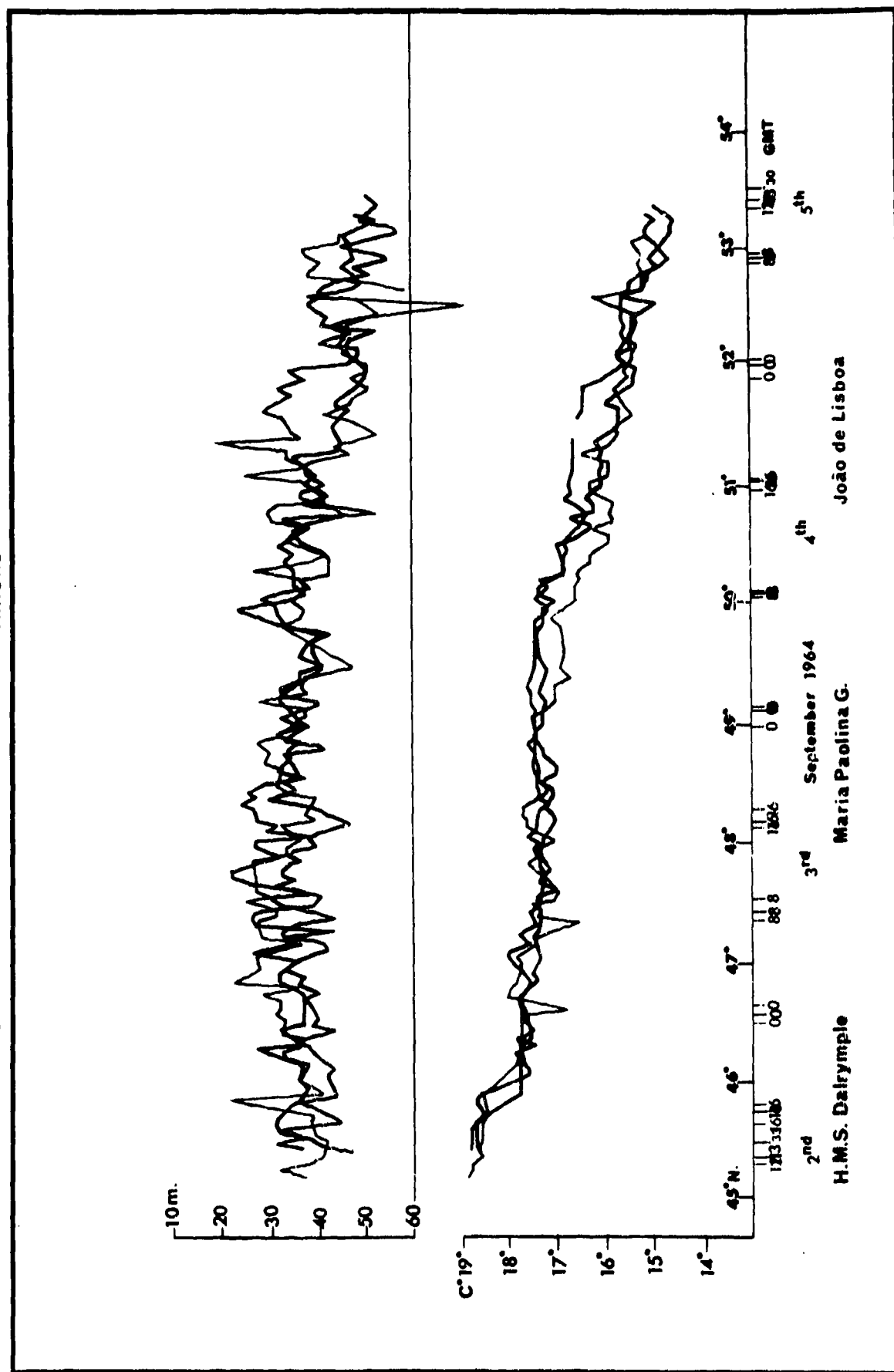


FIG. 3.14

MILOC 64

Phase A, lap 2
LAYER DEPTH AND SEA SURFACE TEMPERATURE
MEASURED SIMULTANEOUSLY ALONG SHIPS TRACKS

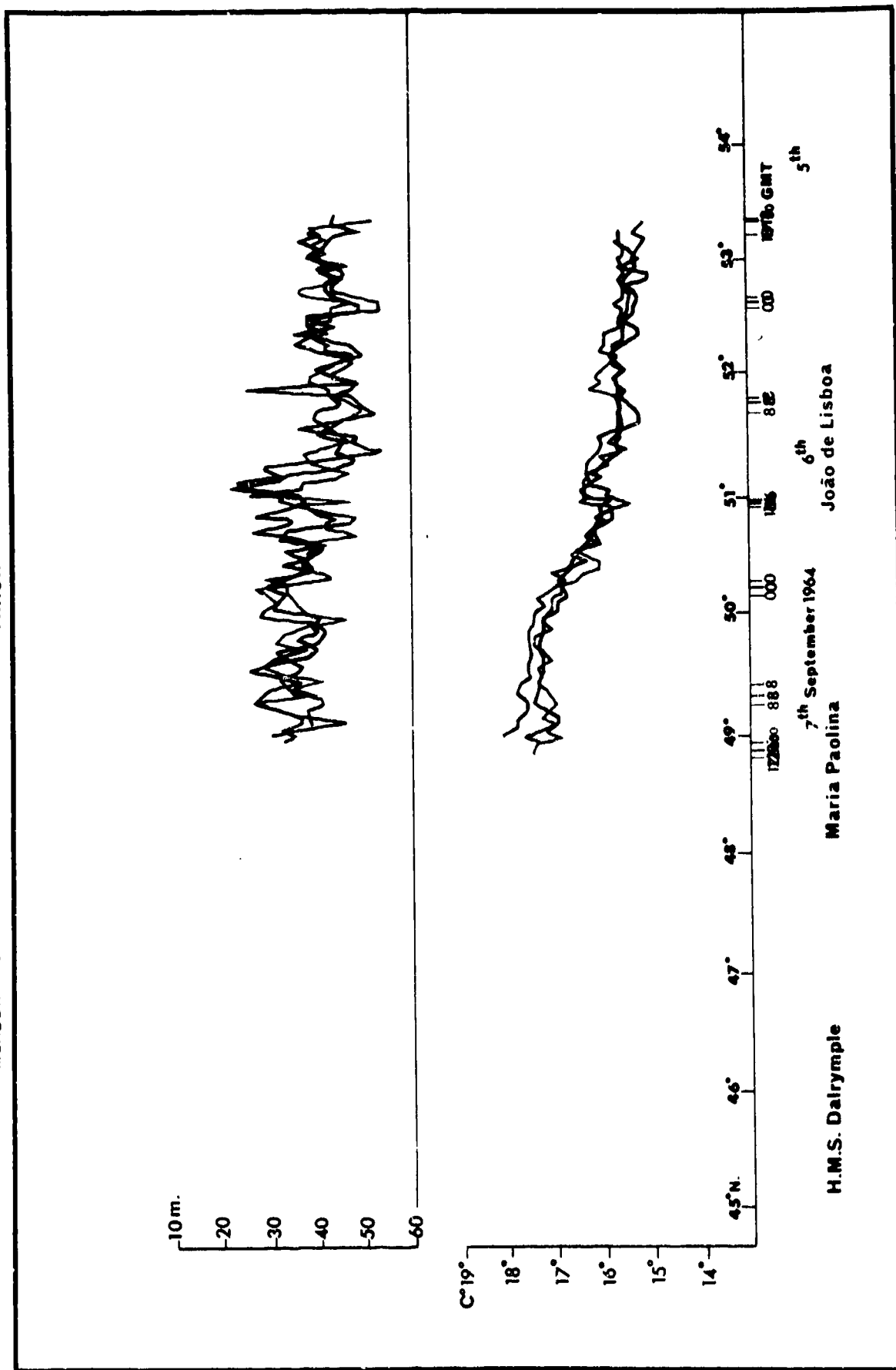


FIG. 3.15

Phase A, lap 3
 LAYER DEPTH AND SEA SURFACE TEMPERATURE
 MEASURED SIMULTANEOUSLY ALONG SHIPS TRACKS

MILOC 64

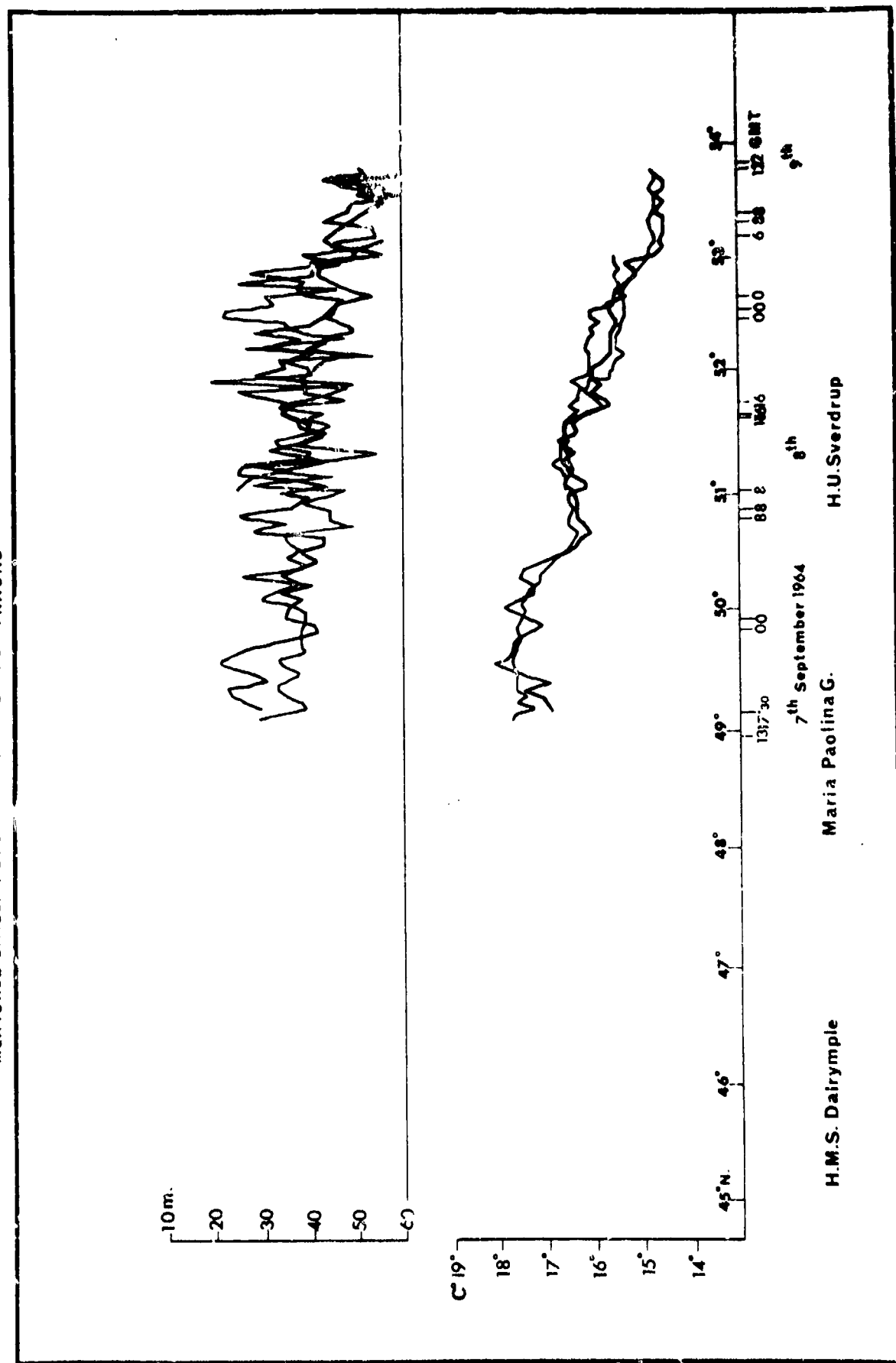
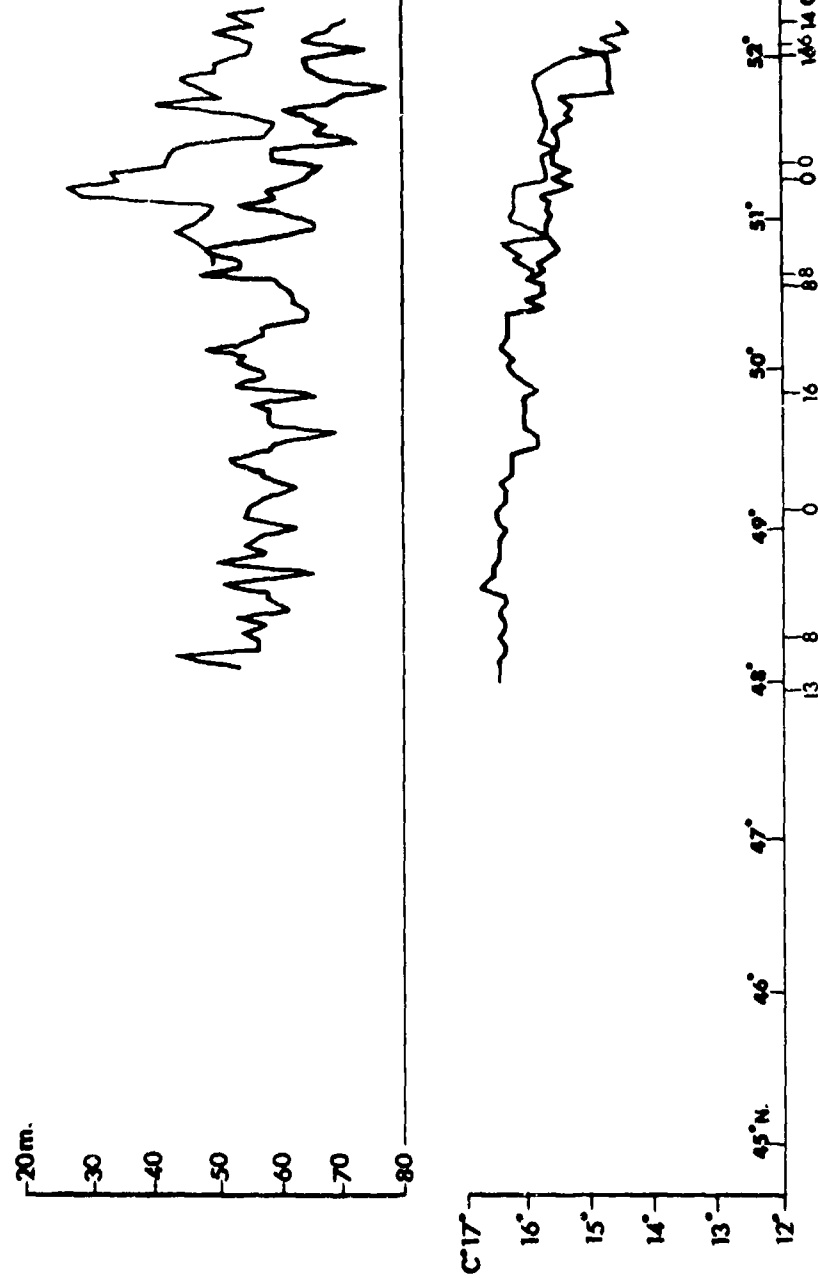


FIG. 3.16

MILOC 64

Phase A, lap 5
 LAYER DEPTH AND SURFACE TEMPERATURE
 MEASURED SIMULTANEOUSLY ALONG SHIPS TRACKS



1st October 1964

2nd

3rd H.M.S. Dalrymple

Maria Paolina G.

FIG. 3.17

MILOC 64 Phase A, lap 1
COMPARISON BETWEEN LAYER DEPTH AND SEA SURFACE TEMPERATURE

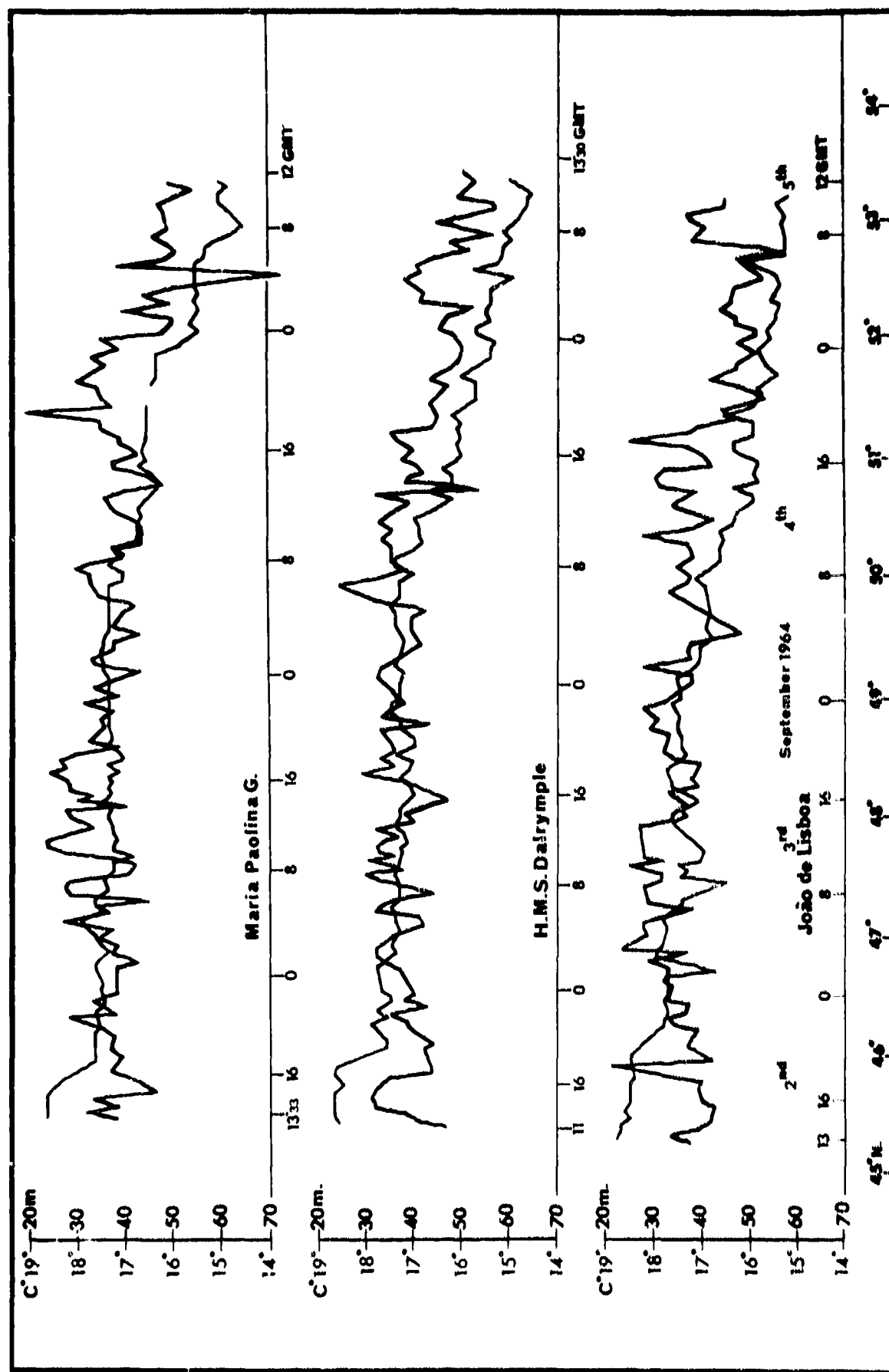


FIG. 3.18

MILOC 64

Phase A, lap 2

COMPARISON BETWEEN LAYER DEPTH AND SEA SURFACE TEMPERATURE

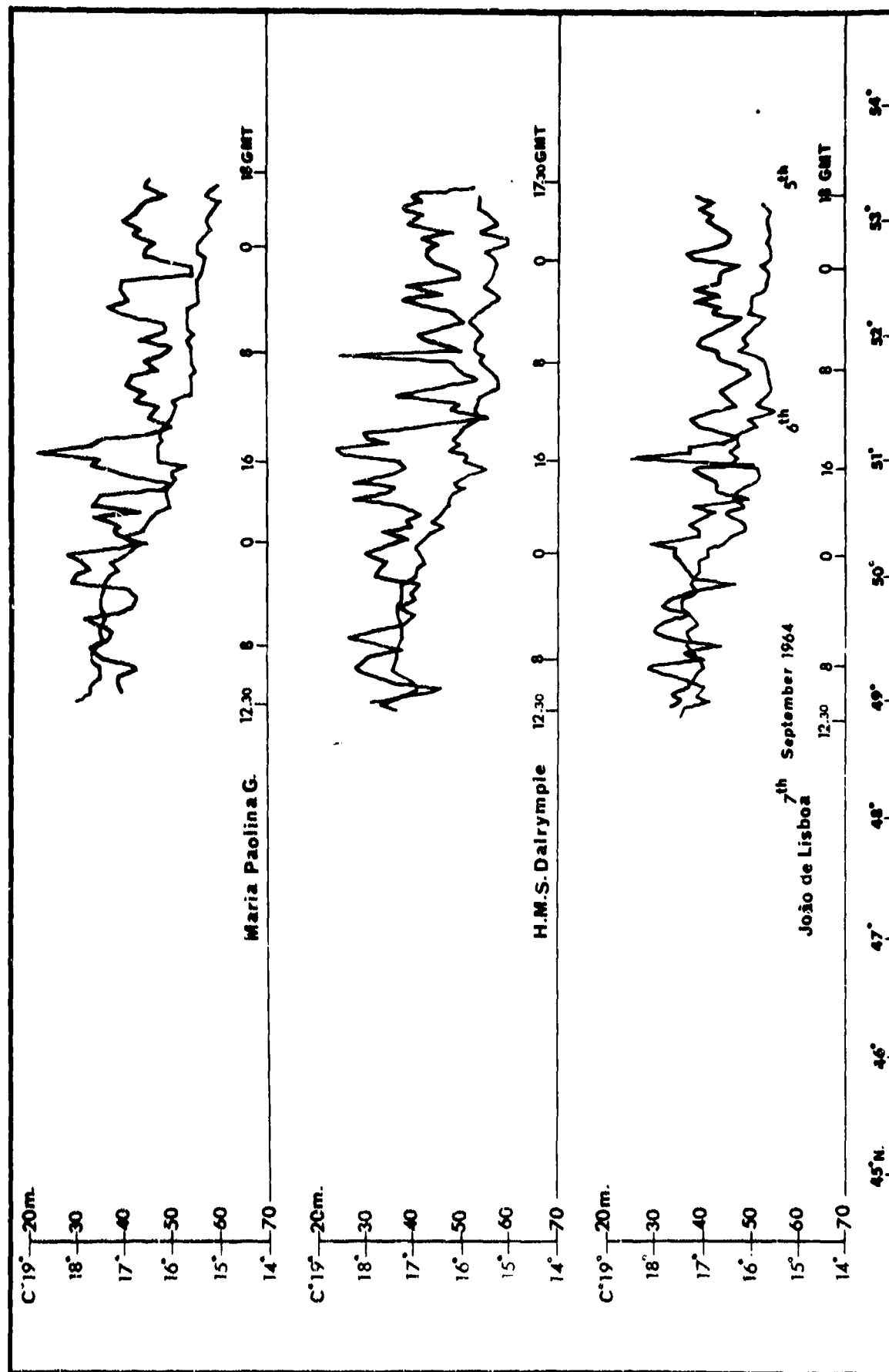


FIG. 3.19

MILOC 64 Phase A, lap 3
COMPARISON BETWEEN LAYER DEPTH AND SEA SURFACE TEMPERATURE

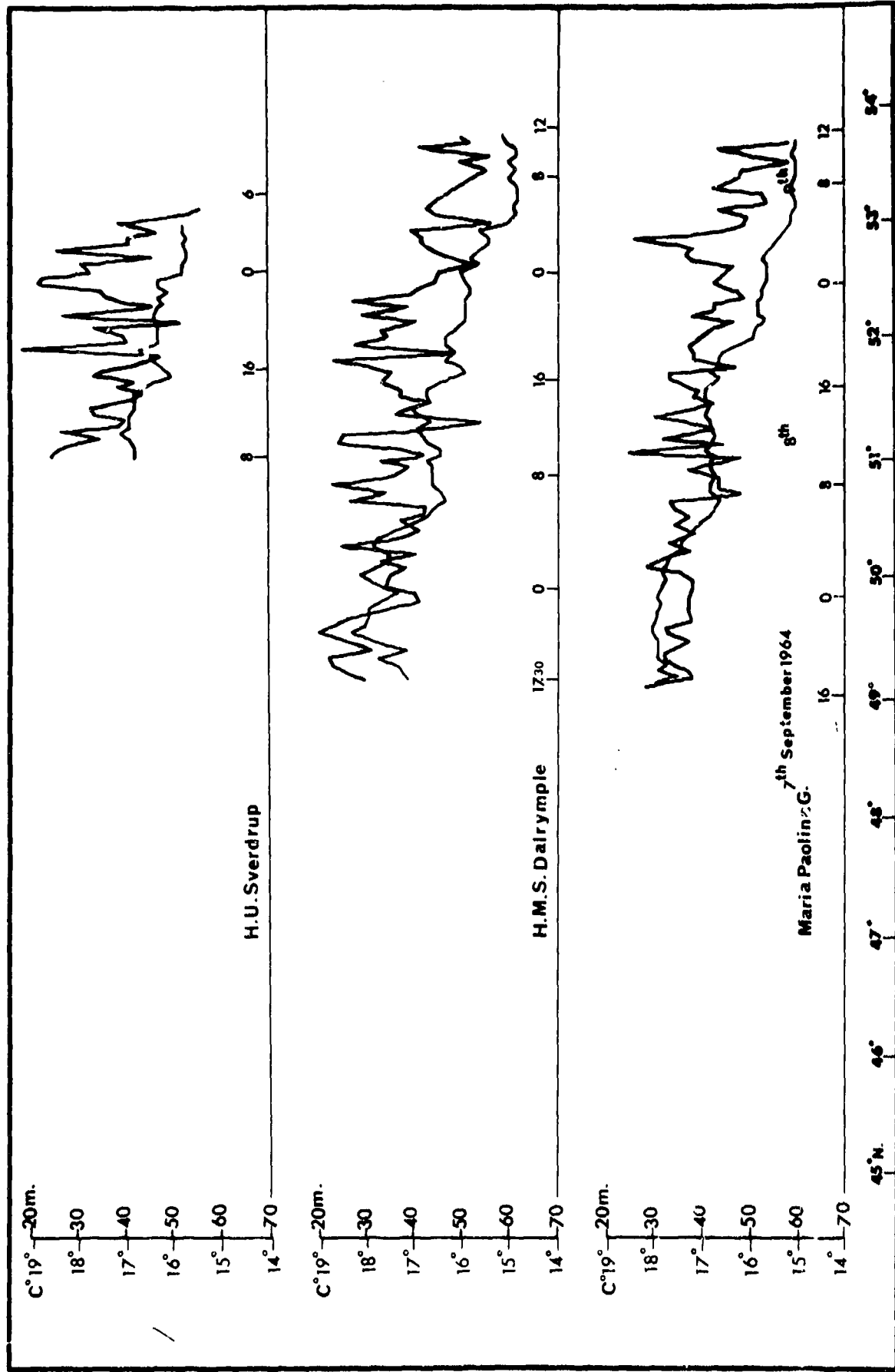


FIG. 3.20

MILOC 64

Phase A, laps 4,5

COMPARISON BETWEEN LAYER DEPTH AND SEA SURFACE TEMPERATURE

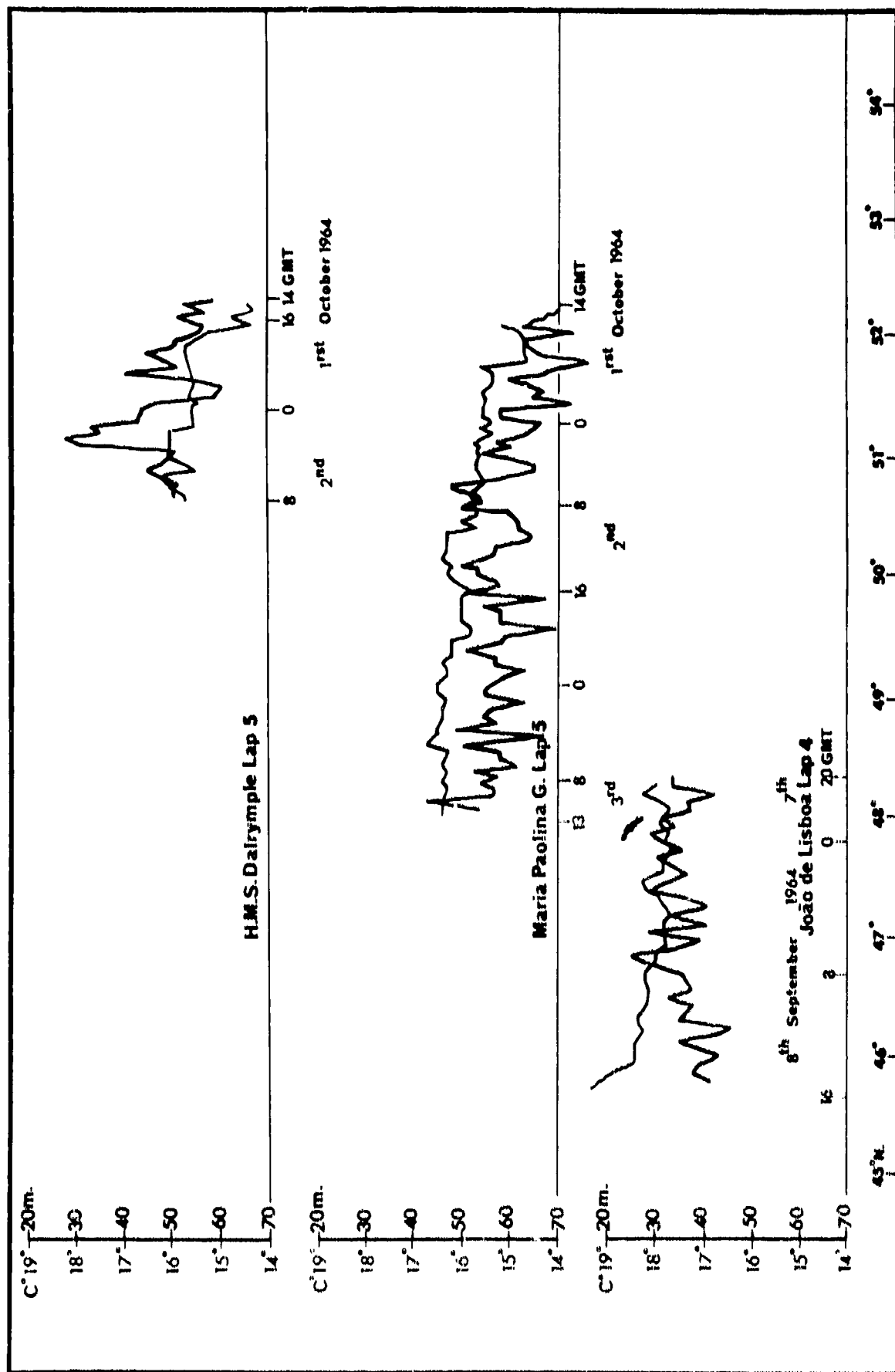


FIG. 3.21

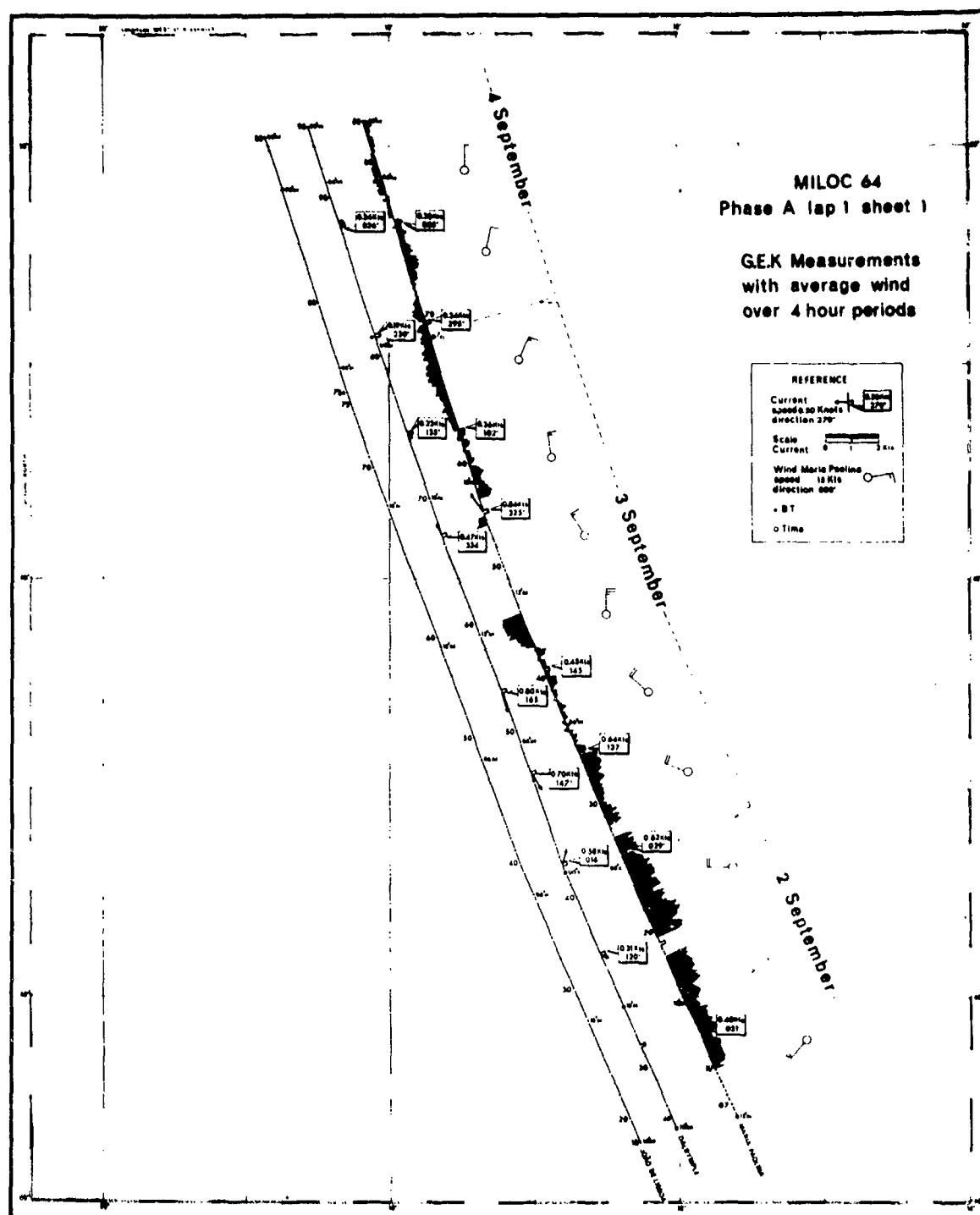


FIG. 4.1

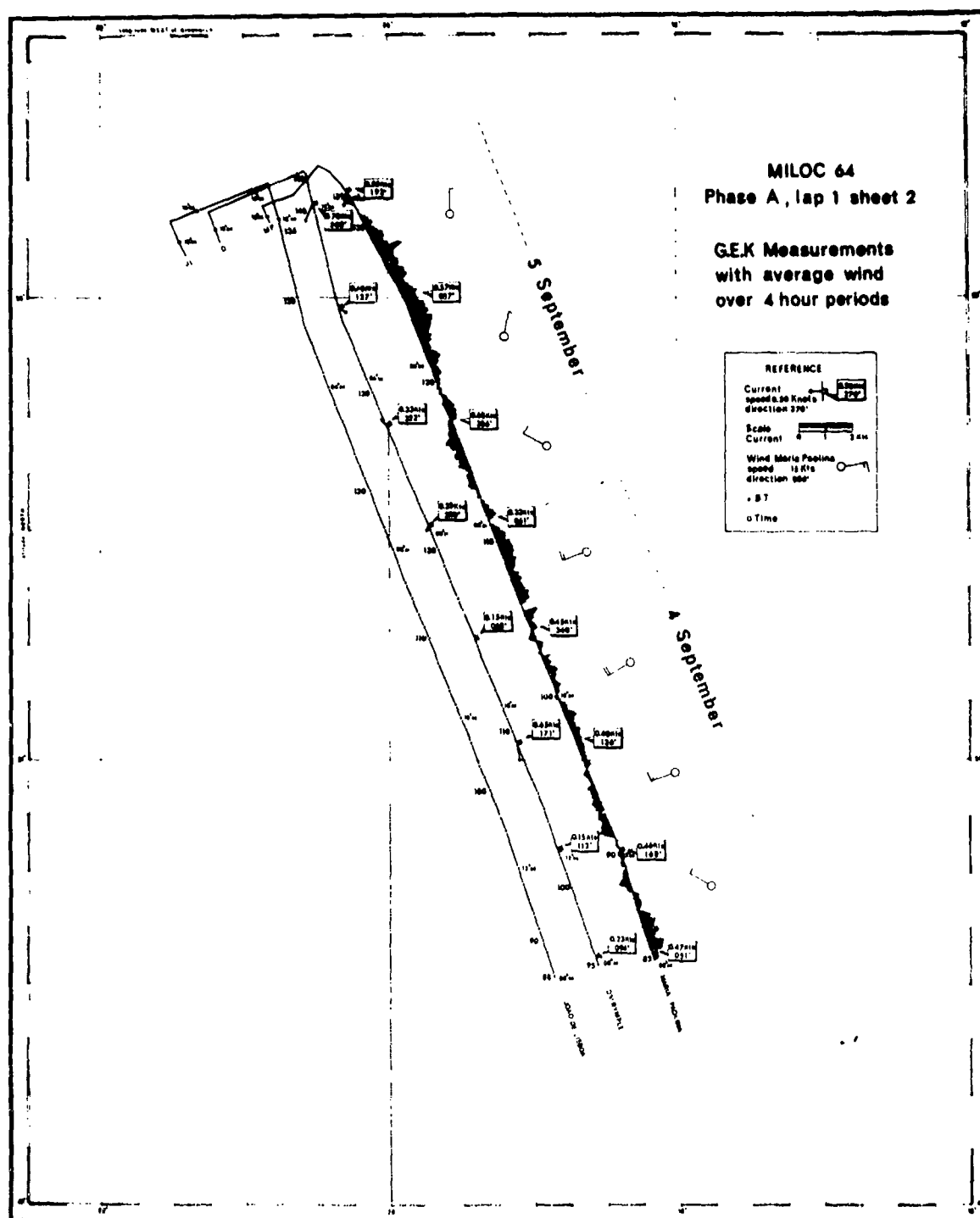


FIG. 4.2

FIG. 4.3

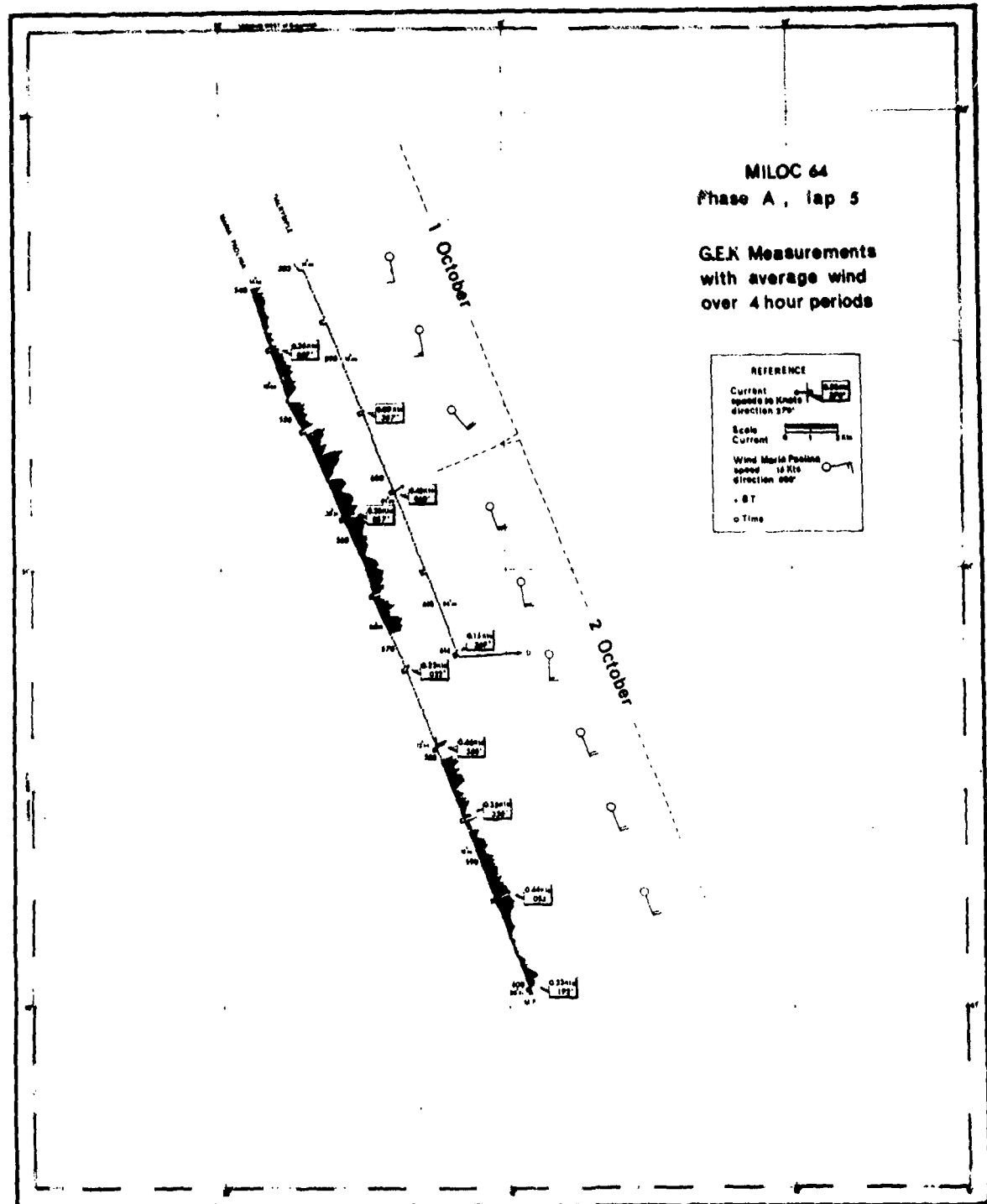


FIG. 4.4

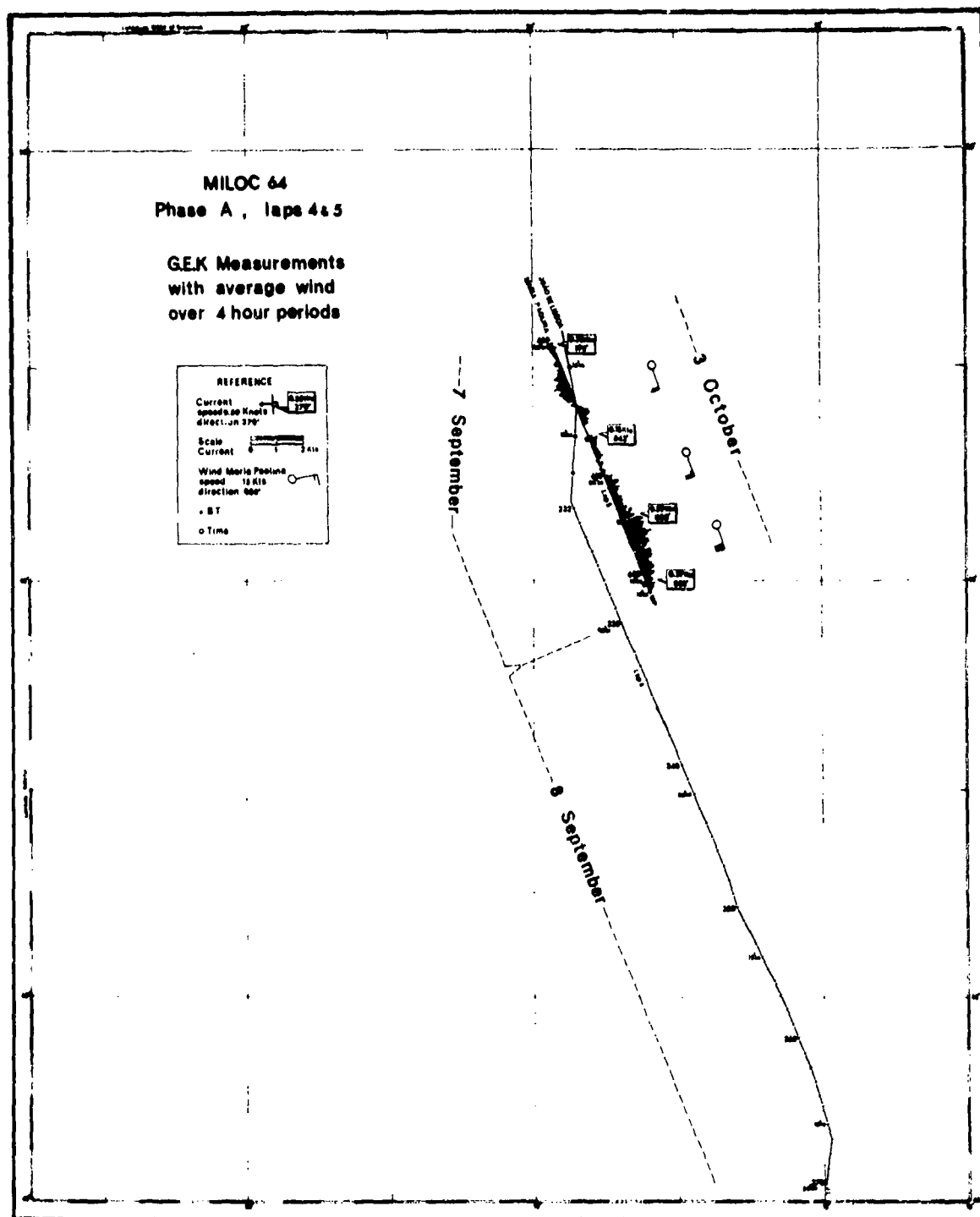


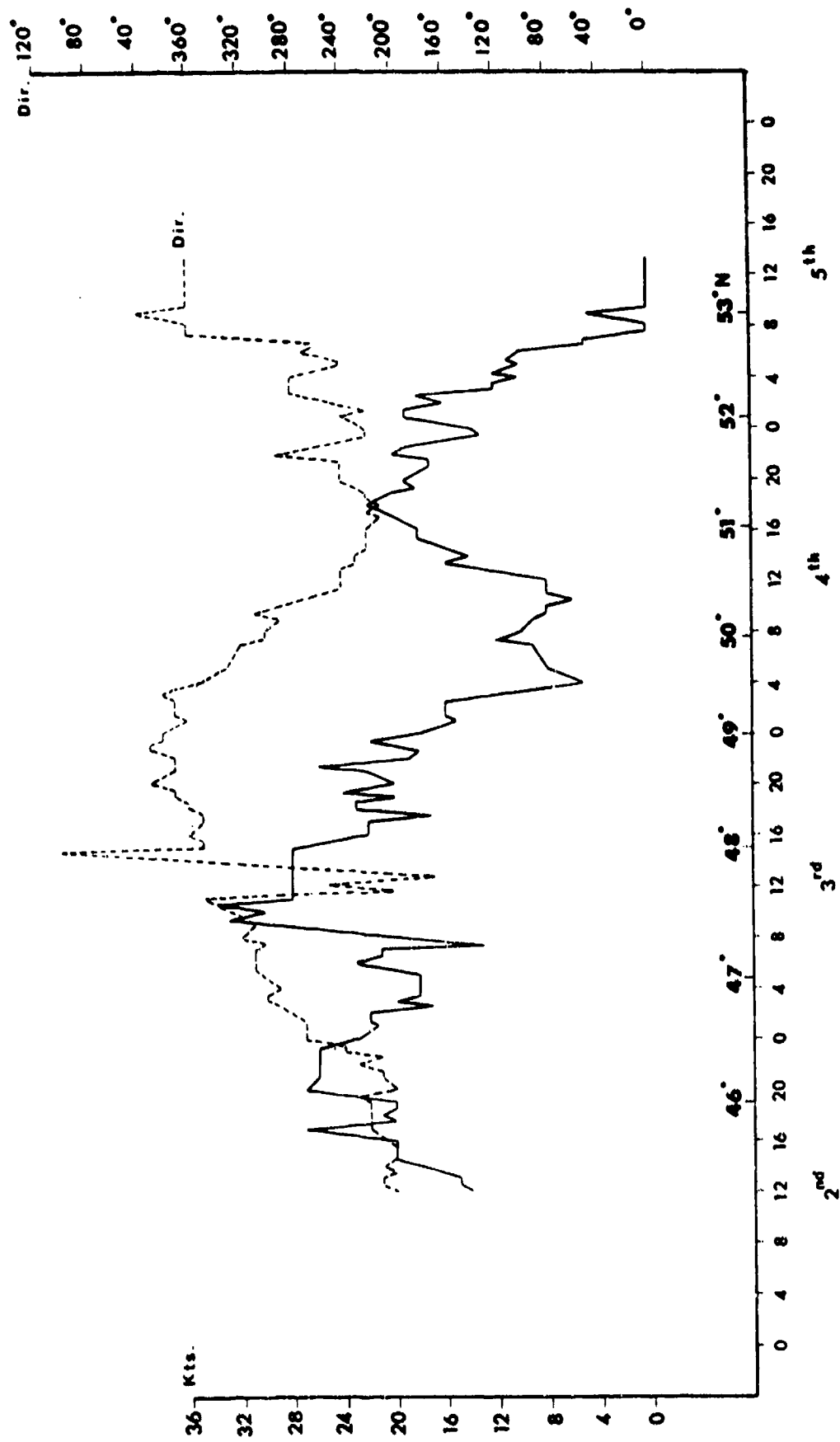
FIG. 4.5

MILOC 64

Phase A, lap 1

João De Lisboa

Wind Speed and Direction



September 1964

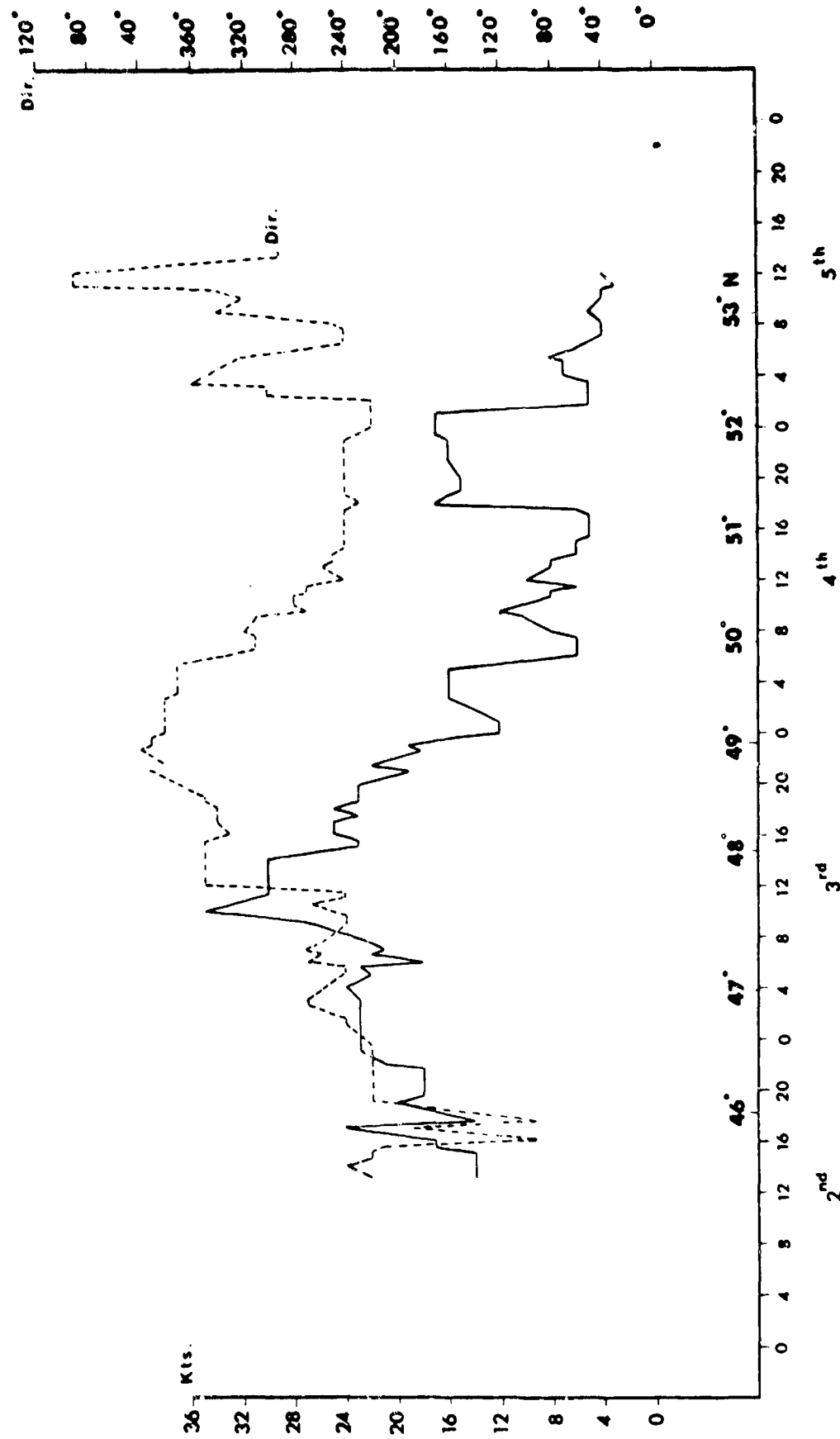
FIG. 5.1

MILOC 64

Phase A, lap 1

H.M.S. Dairymple

Wind Speed and Direction



September 1964

FIG. 5.2

9 100. 010

MILOC 64 **Phase A, lap 1** **Maria Paolina G.**
Wind Speed and Direction

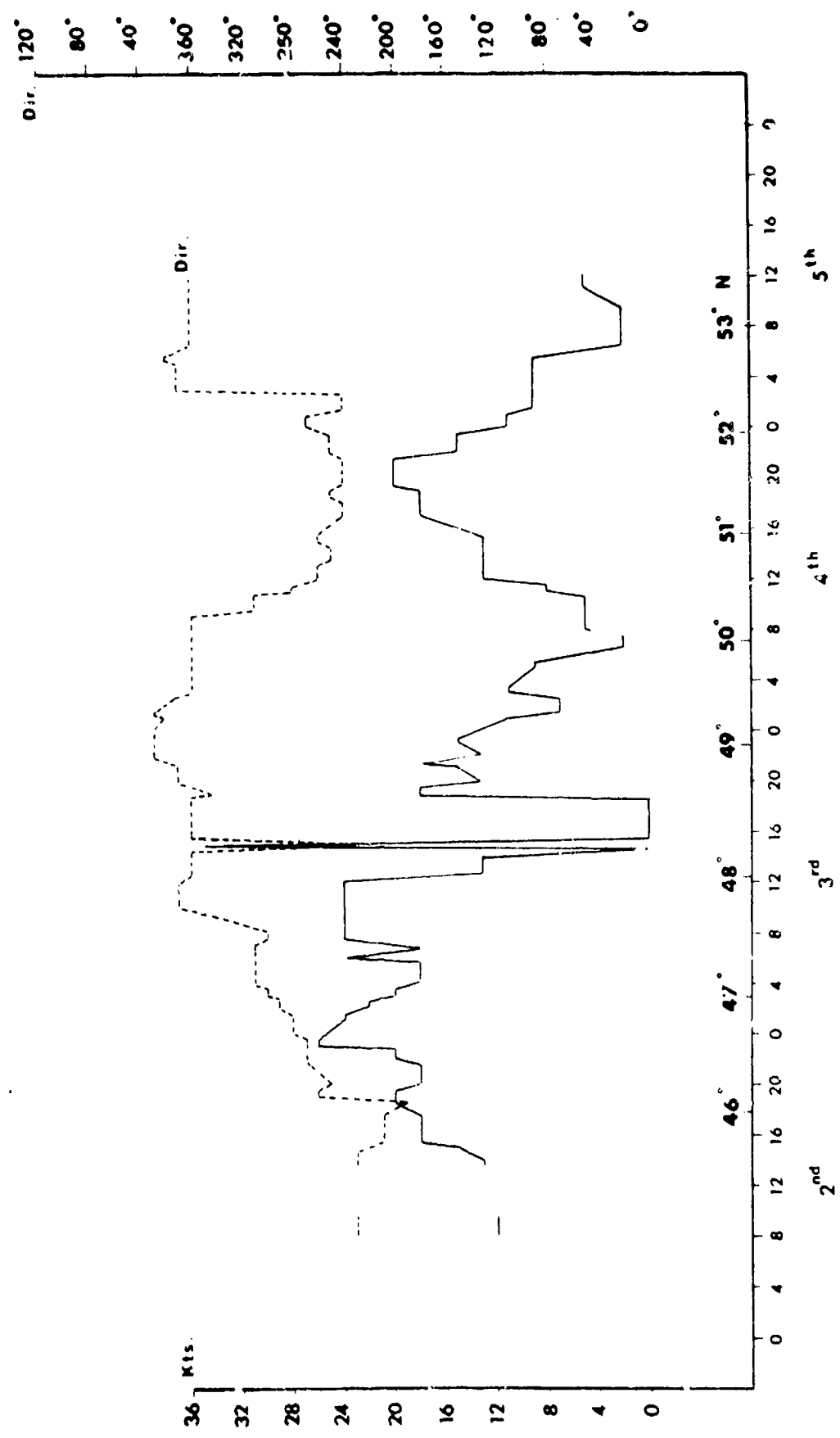


FIG. 5.3

MILOC 64

Phase A, lap 2

João De Lisboa

Wind Speed and Direction

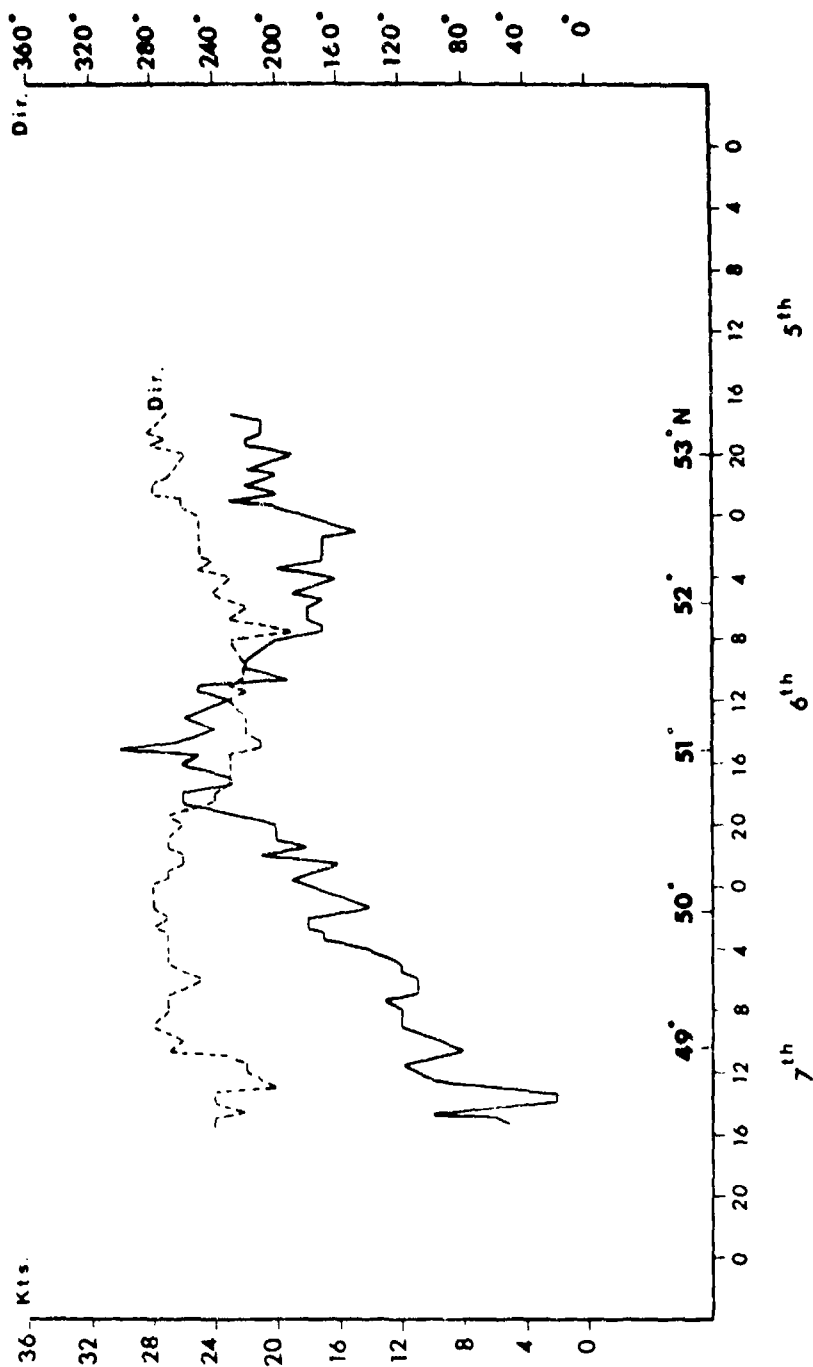


FIG. 5.4

H.M.S. Oatrymple

Phase A, lap 2

Wind Speed and Direction

MILOC 6th

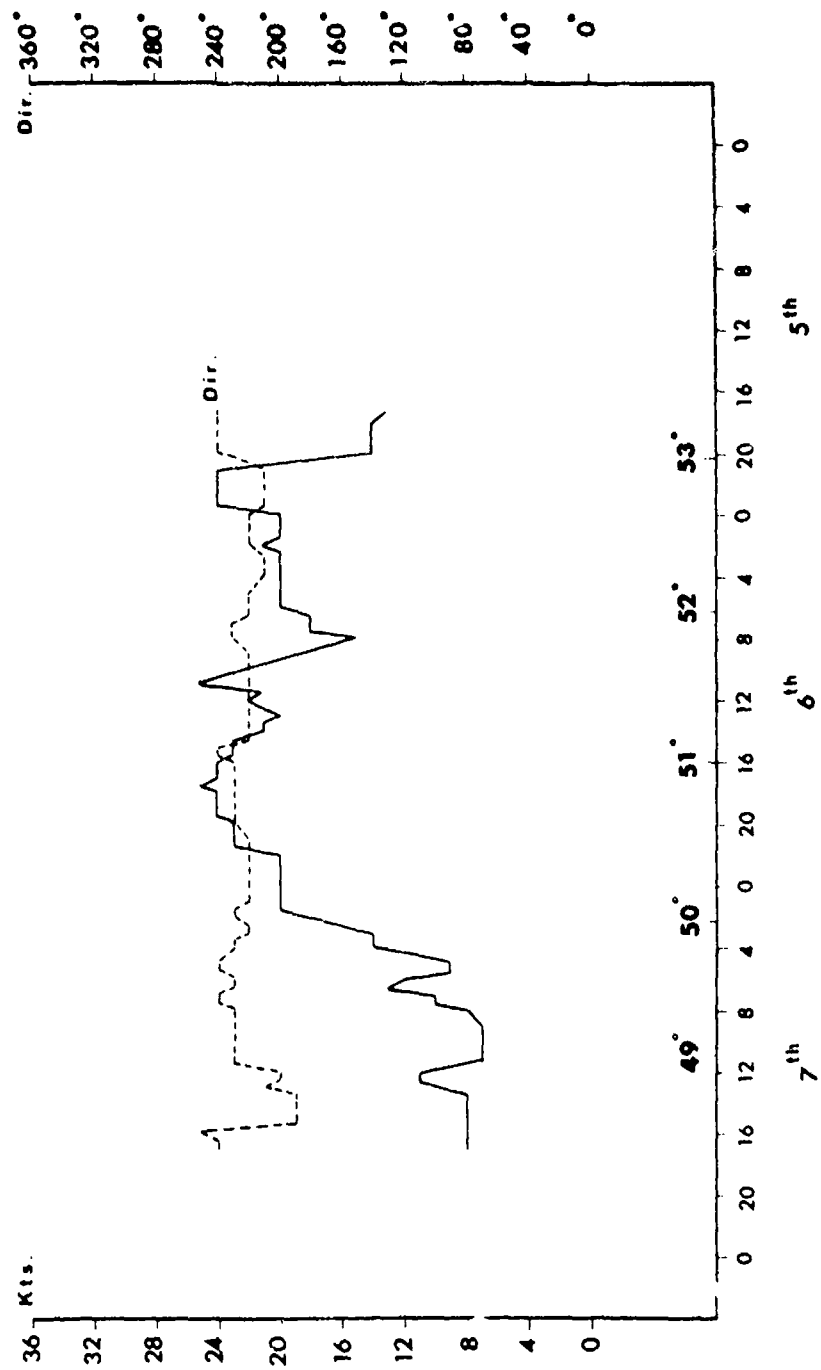


FIG. 5.5

Maria Paolina G.

Phase A, lap 2

Wind Speed and Direction

MILOC 64

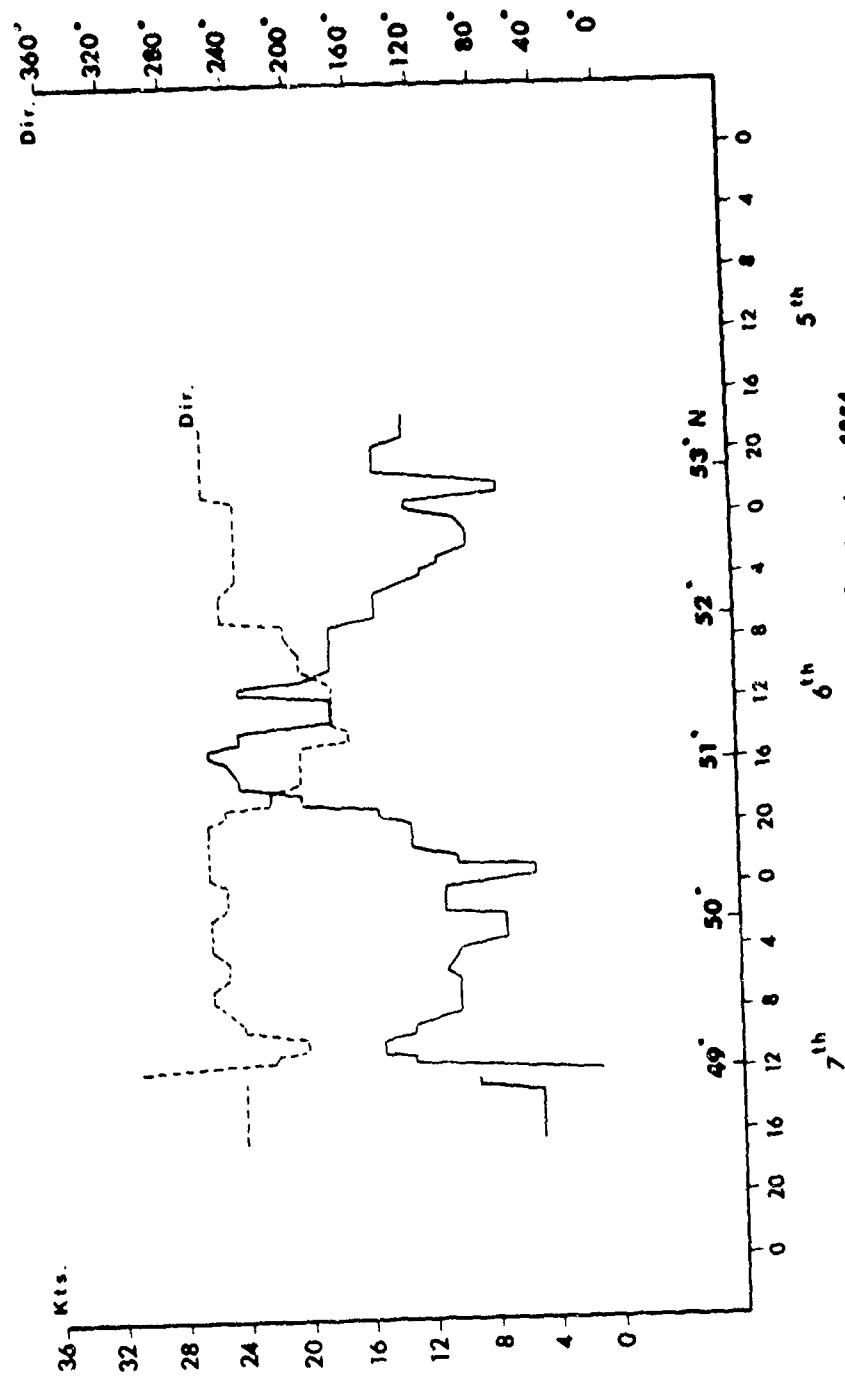


FIG. 5.6

FIG. 5.6

MILOC 64
Phase A, lap 3
Wind Speed and Direction
H.M.S. Dalrymple

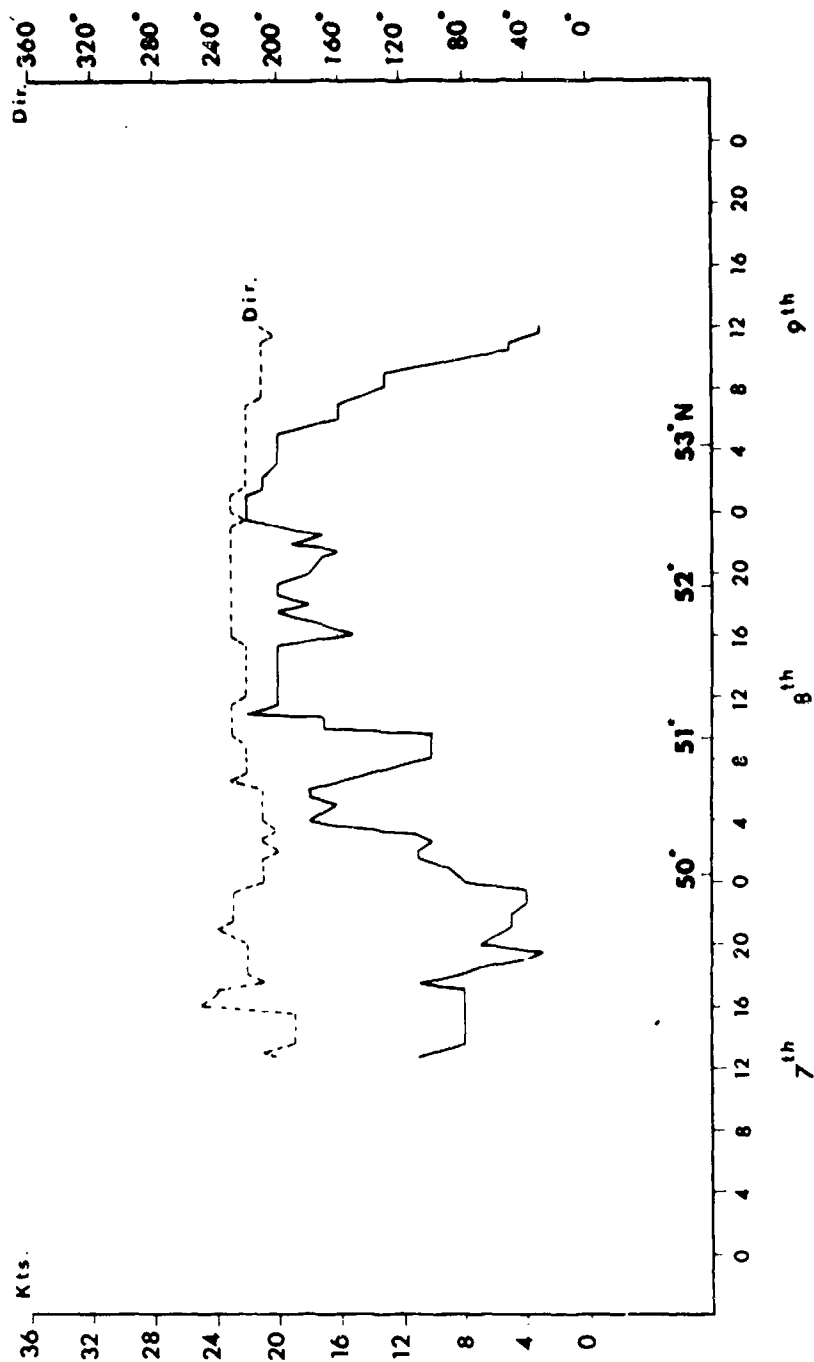


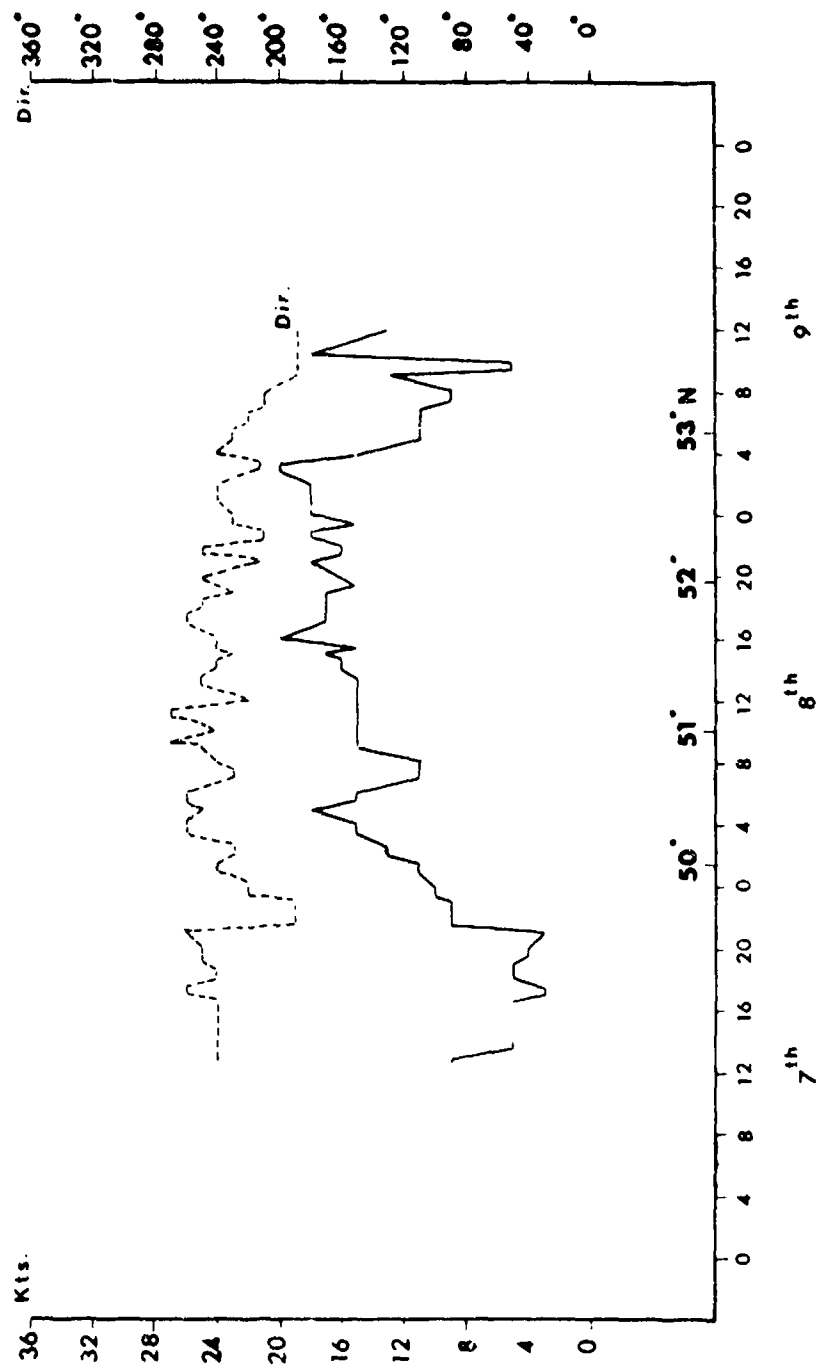
FIG. 5.7

MILOC 64

Phase A, lap 3

Maria Paolina G.

Wind Speed and Direction



September 1964

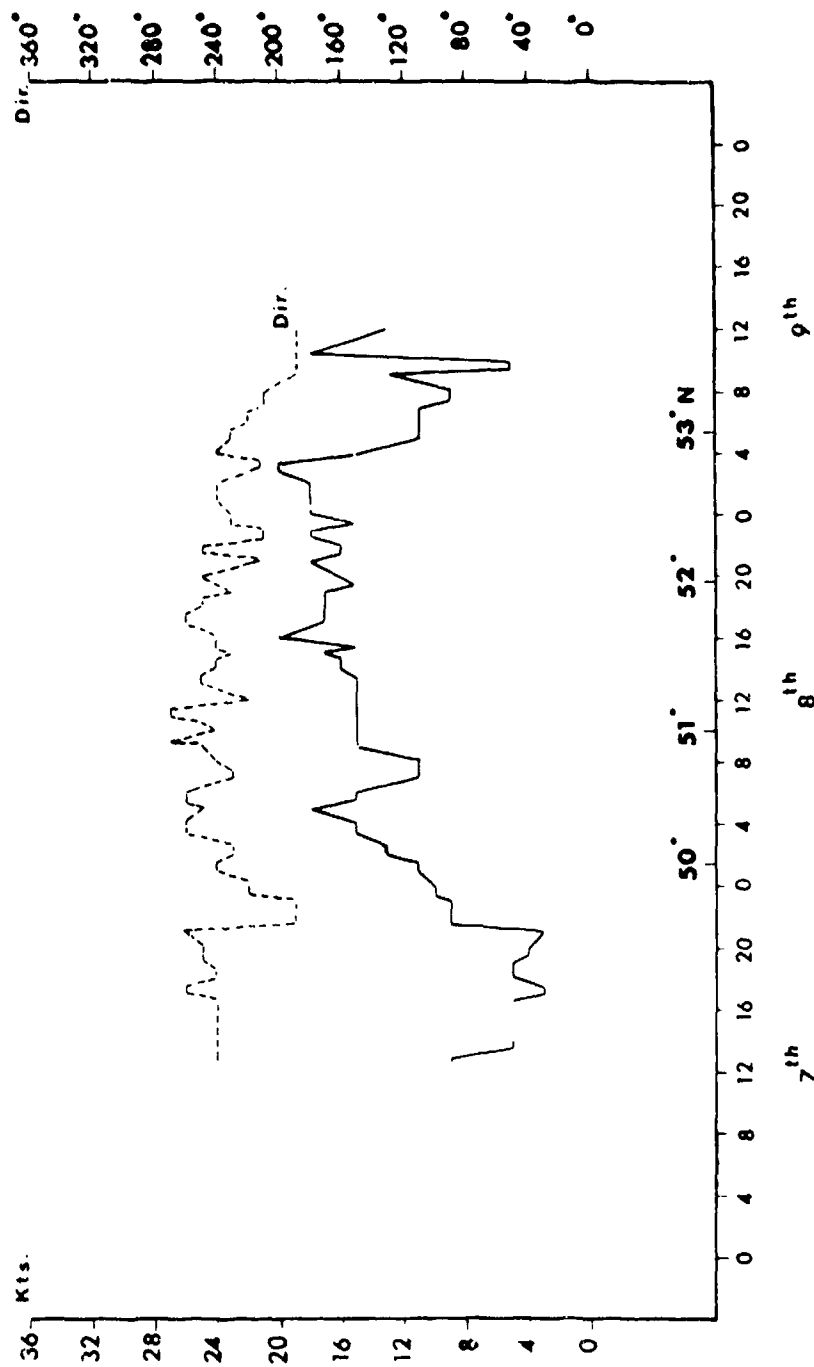
FIG. 5.8

MILOC 64

Phase A, lap 3

Maria Paolina G.

Wind Speed and Direction

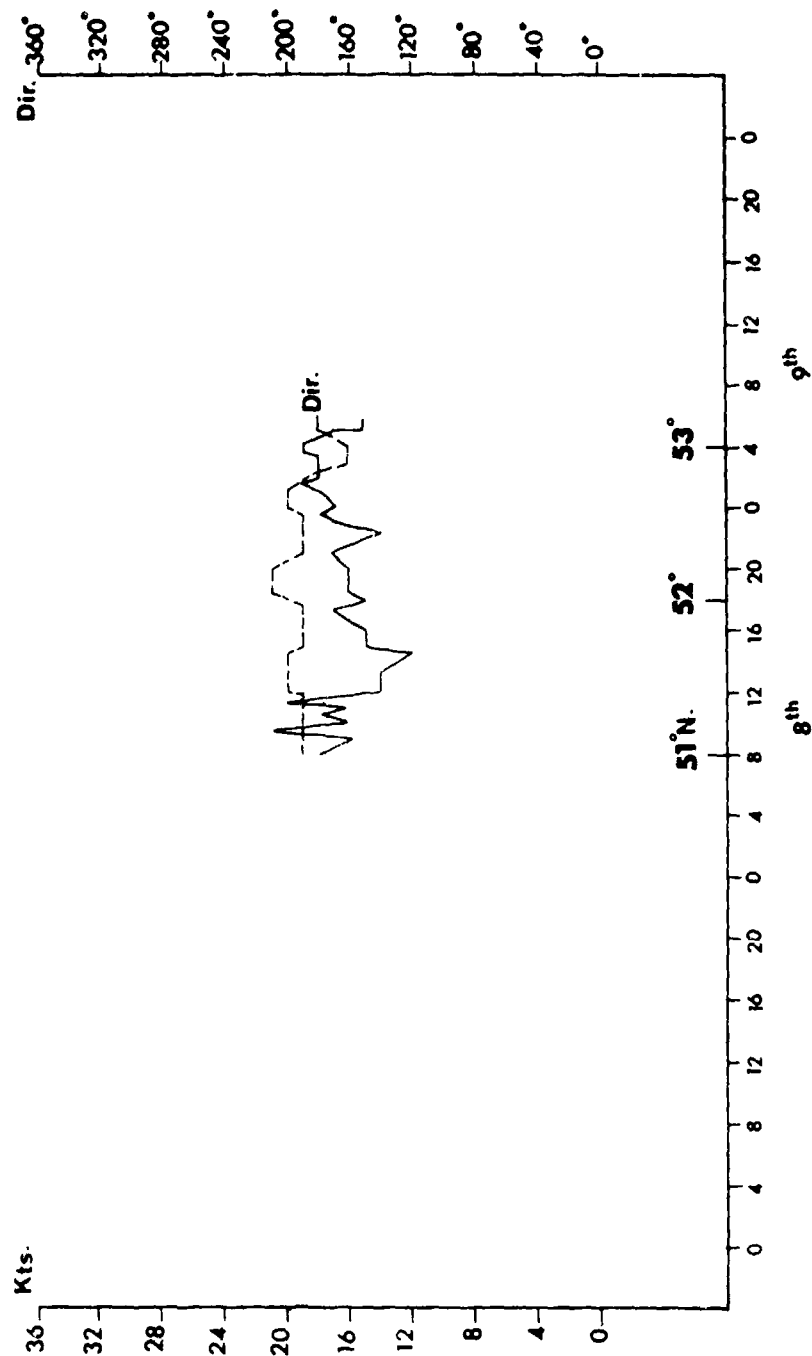


September 1964

FIG. 5.8

FIG. 5.8

MILOC 64 **Phase A, lap 3** **H.U. Sverdrup**
 Wind Speed and Direction



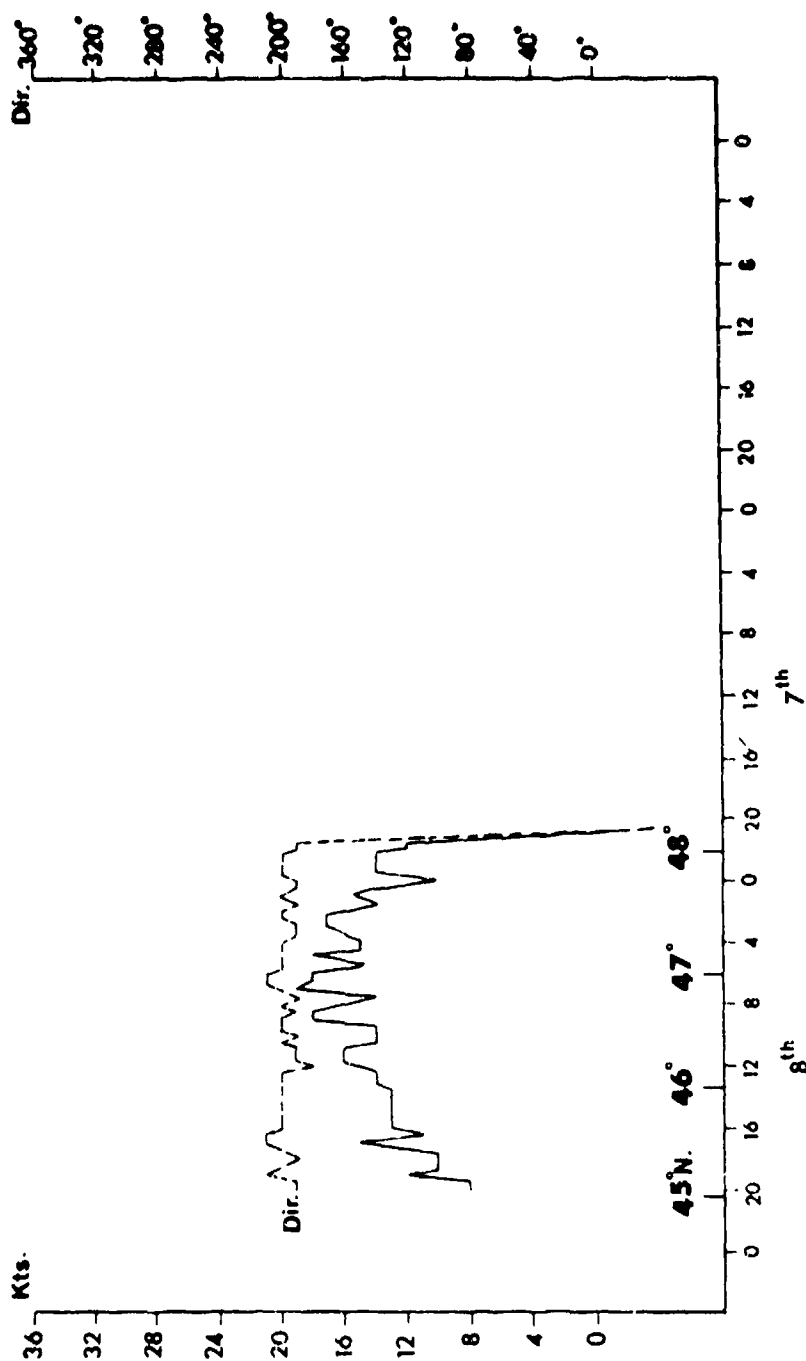
September 1964

FIG. 5.8a

MILOC 64

Phase A, lap 4

Wind Speed and Direction



September 1964

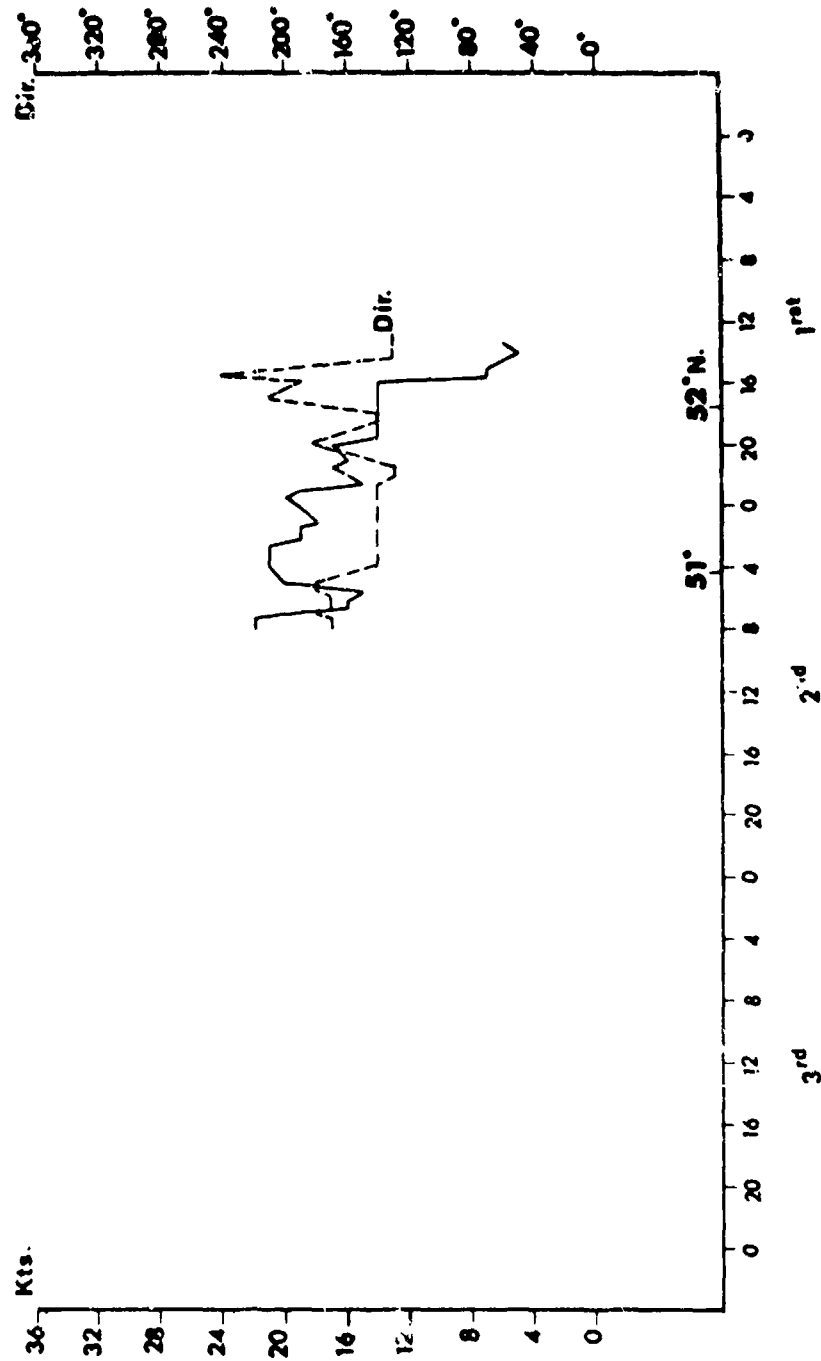
FIG. 5.8b

MILOC 64

Phase A, lap 5

HMS. Dalrymple

Wind Speed and Direction



October 1964

FIG. 5.9

FIG. 5.9

MILOC 64 **Phase A, lap 5** **Maria Paolina G.**
Wind Speed and Direction

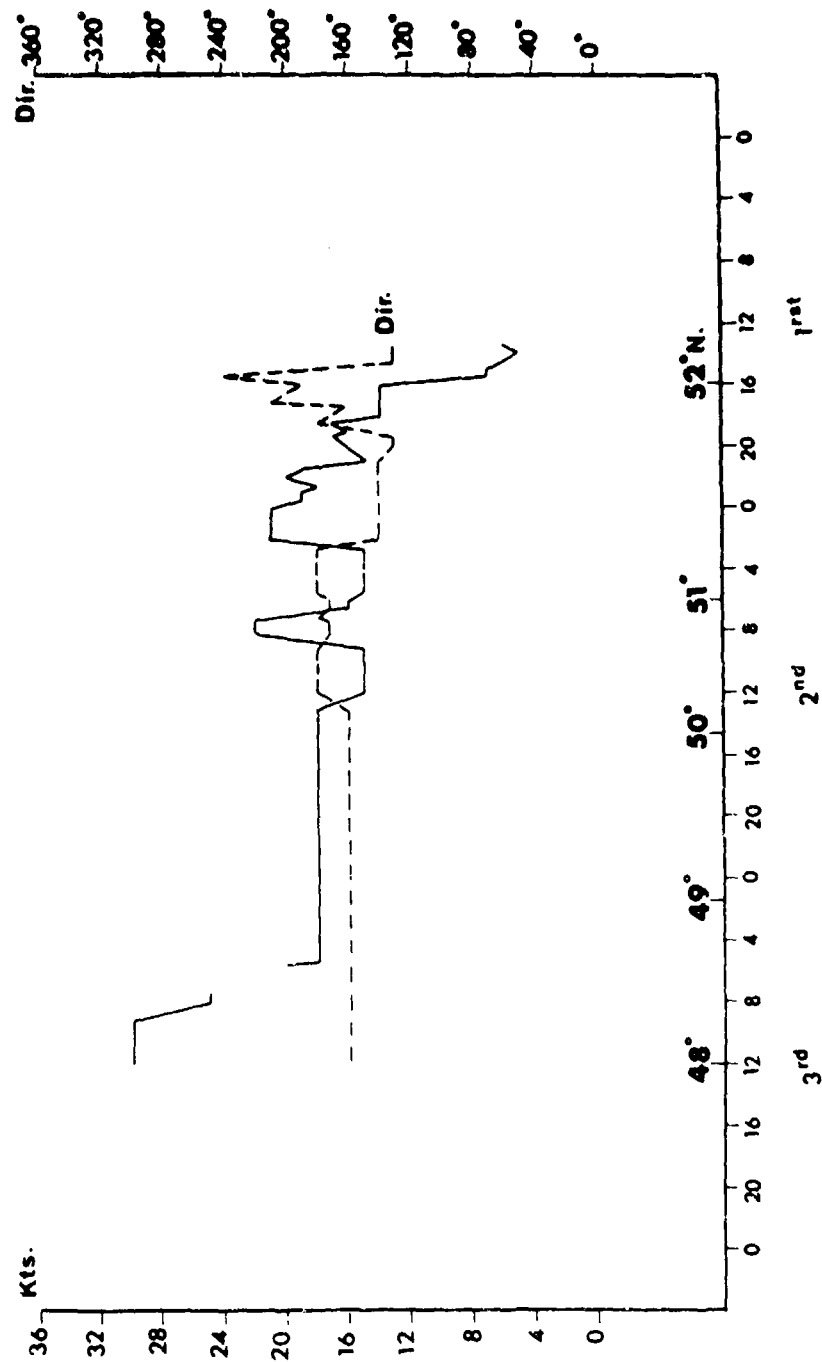


FIG. 5.10

Phase A, lap 1

Air Temperature

João de Lisboa

MILOC 64

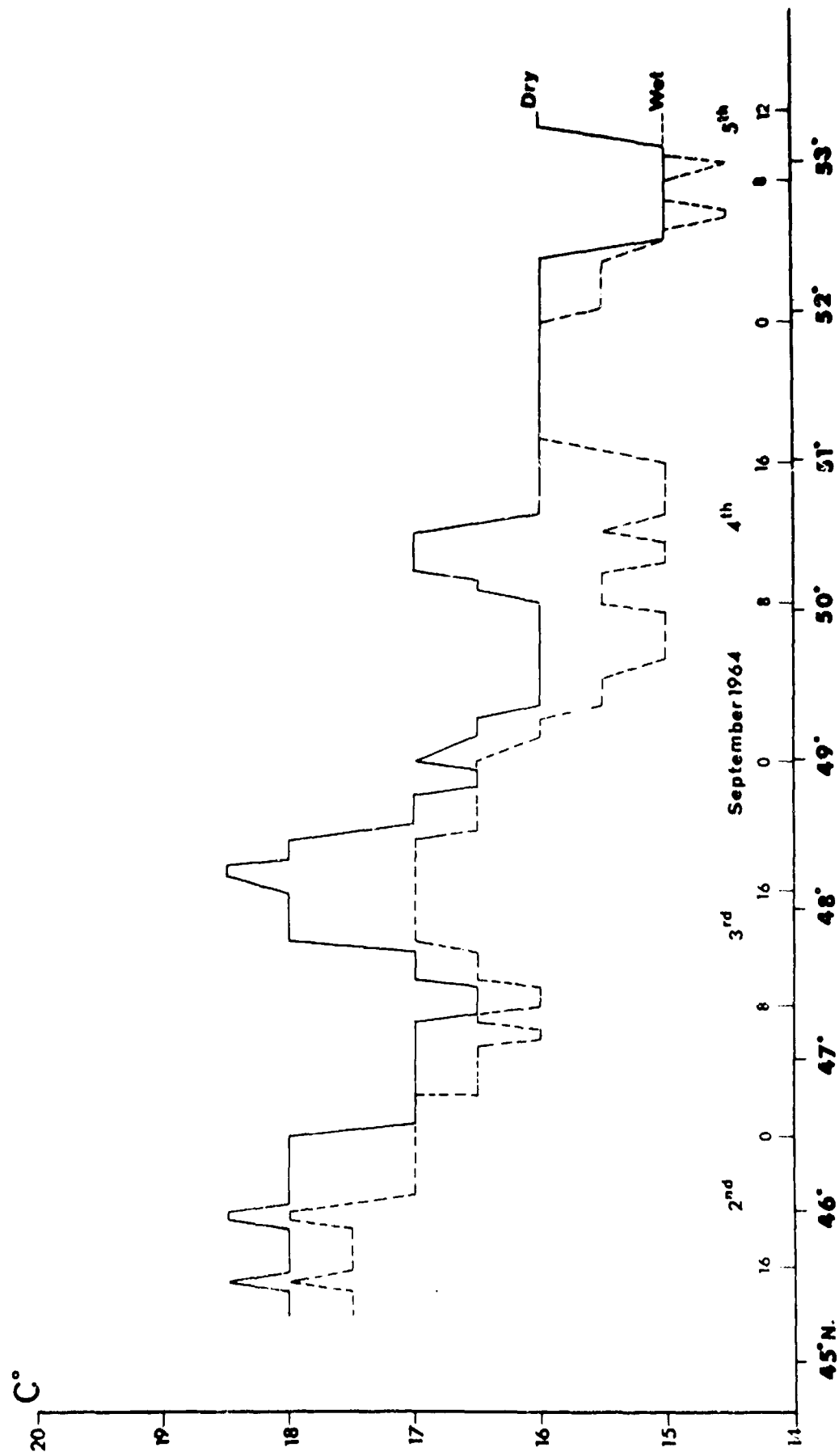


FIG. 5.11

MILOC 64

Phase A, lap 1

H.M.S. Dalrymple

Air Temperature

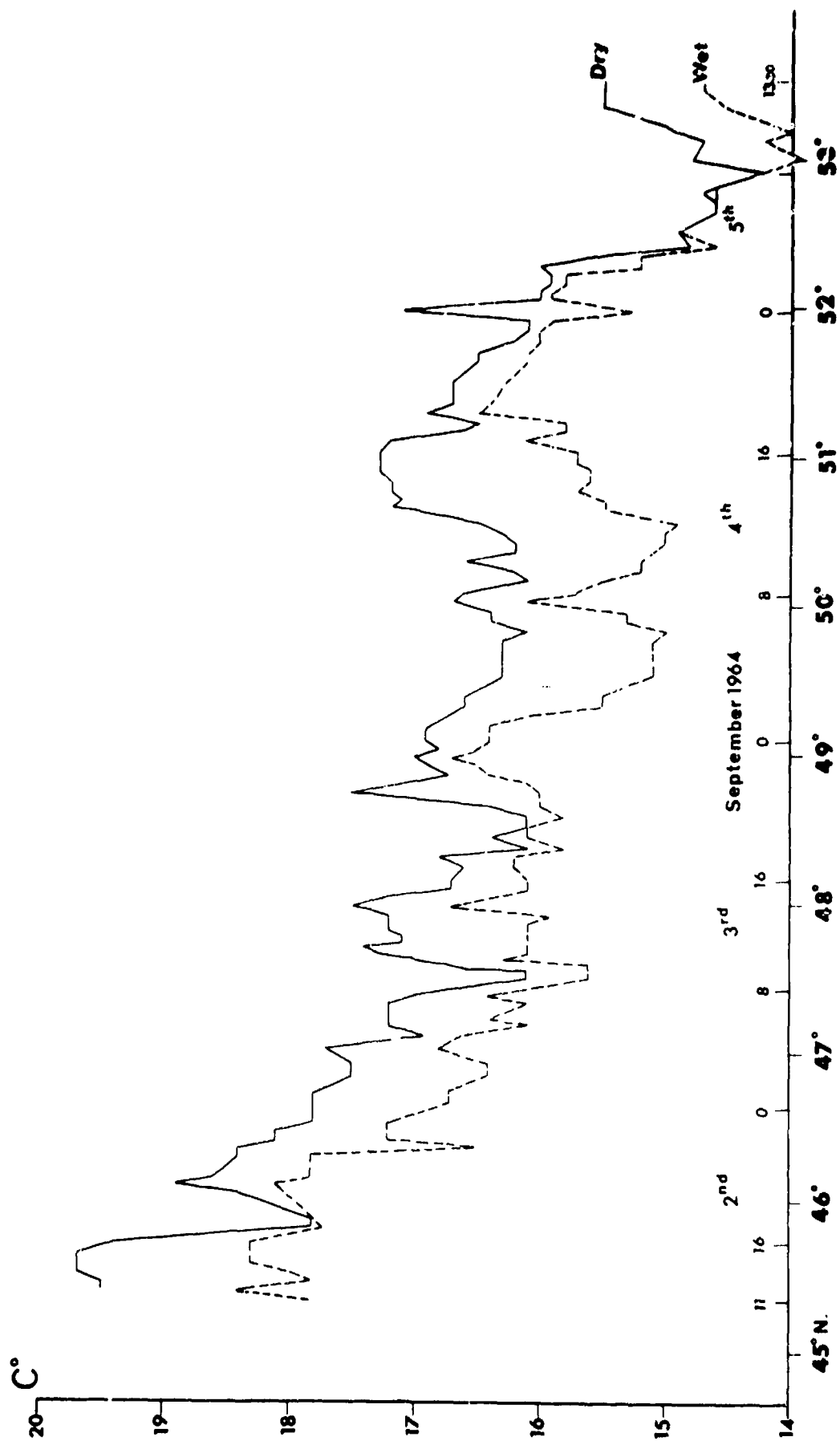


FIG. 5.12

MILOC 64

Phase A, lap 1

Air Temperature

Maria Paolina G.

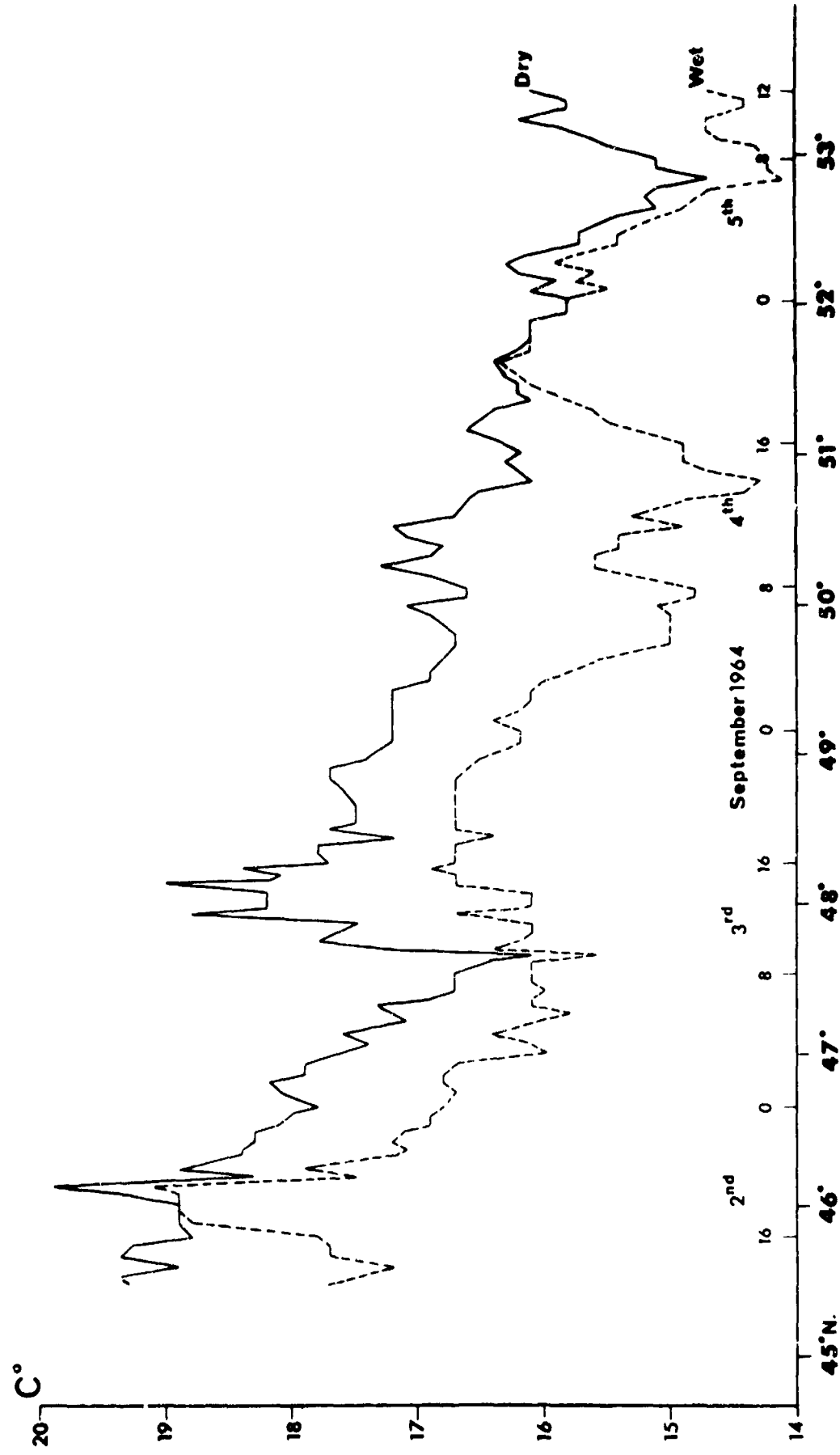


FIG. 5.13

MILOC 64

Phase A, lap 2

João de Lisboa

Air Temperature

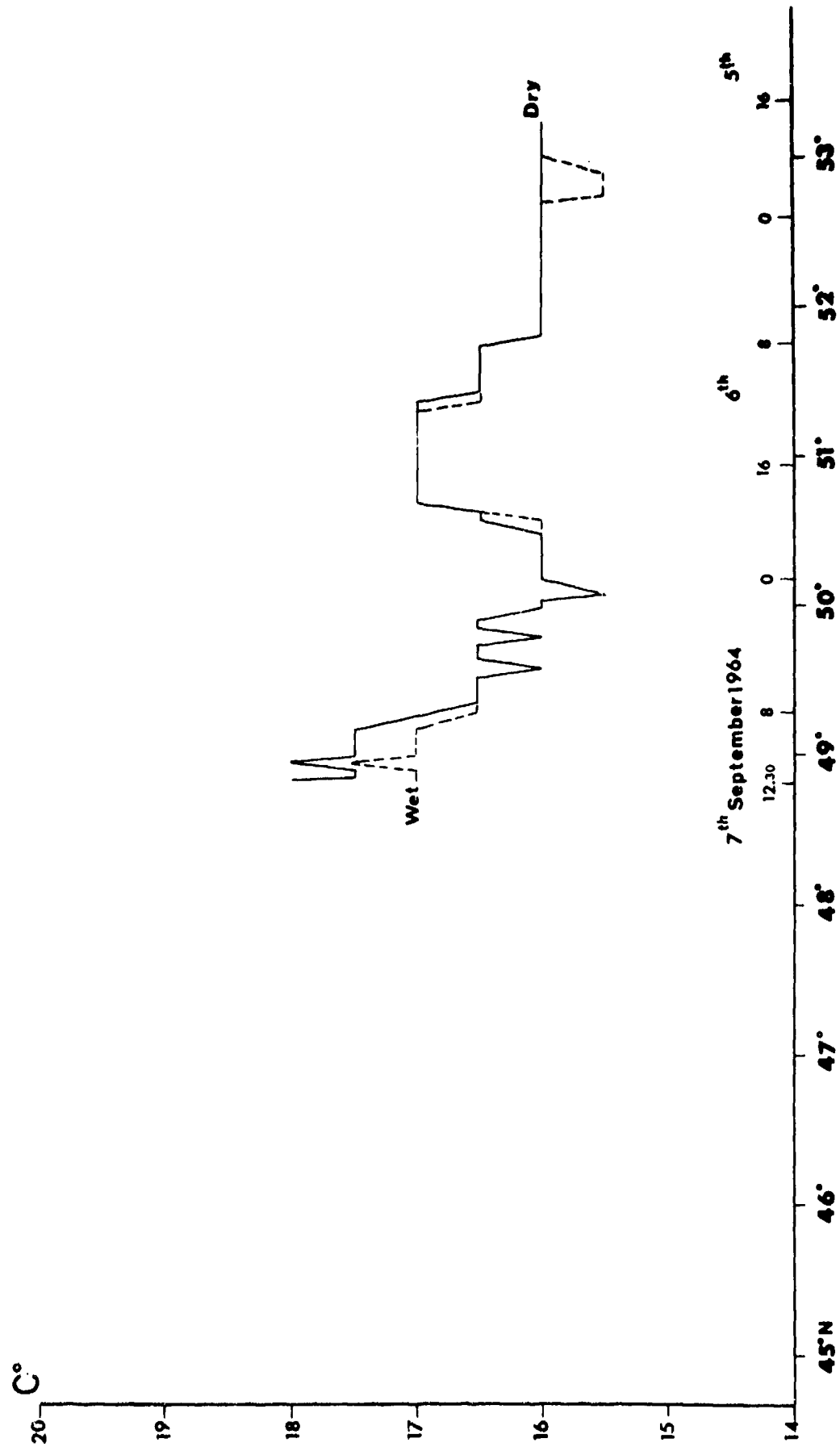


FIG. 5.14

MILOC 64

Phase A, lap 2

H.M.S. Dalrymple

Air Temperature

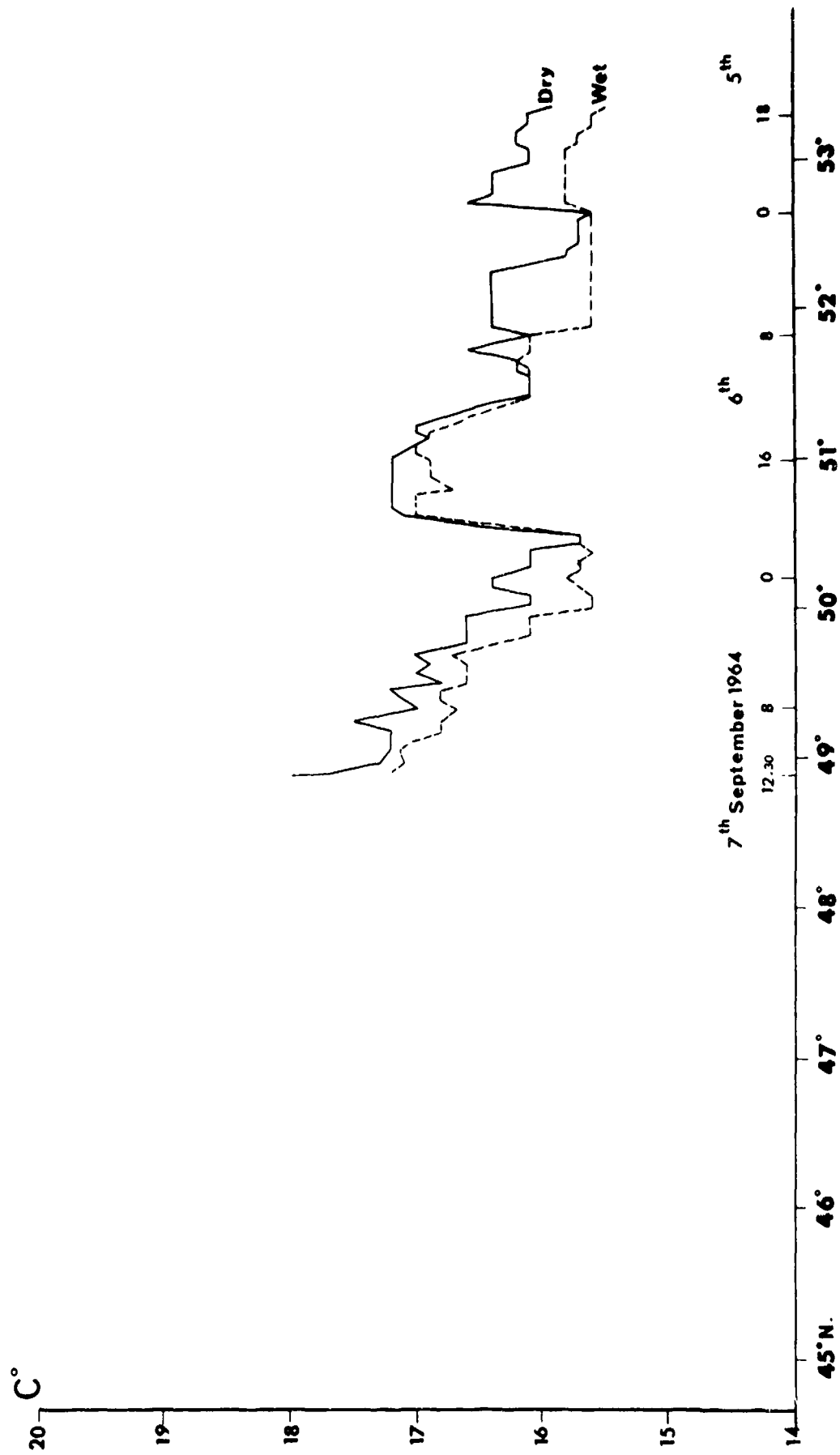


FIG. 5.15

MILOC 64

Phase A, lap 2

Maria Paolina G.

Air Temperature

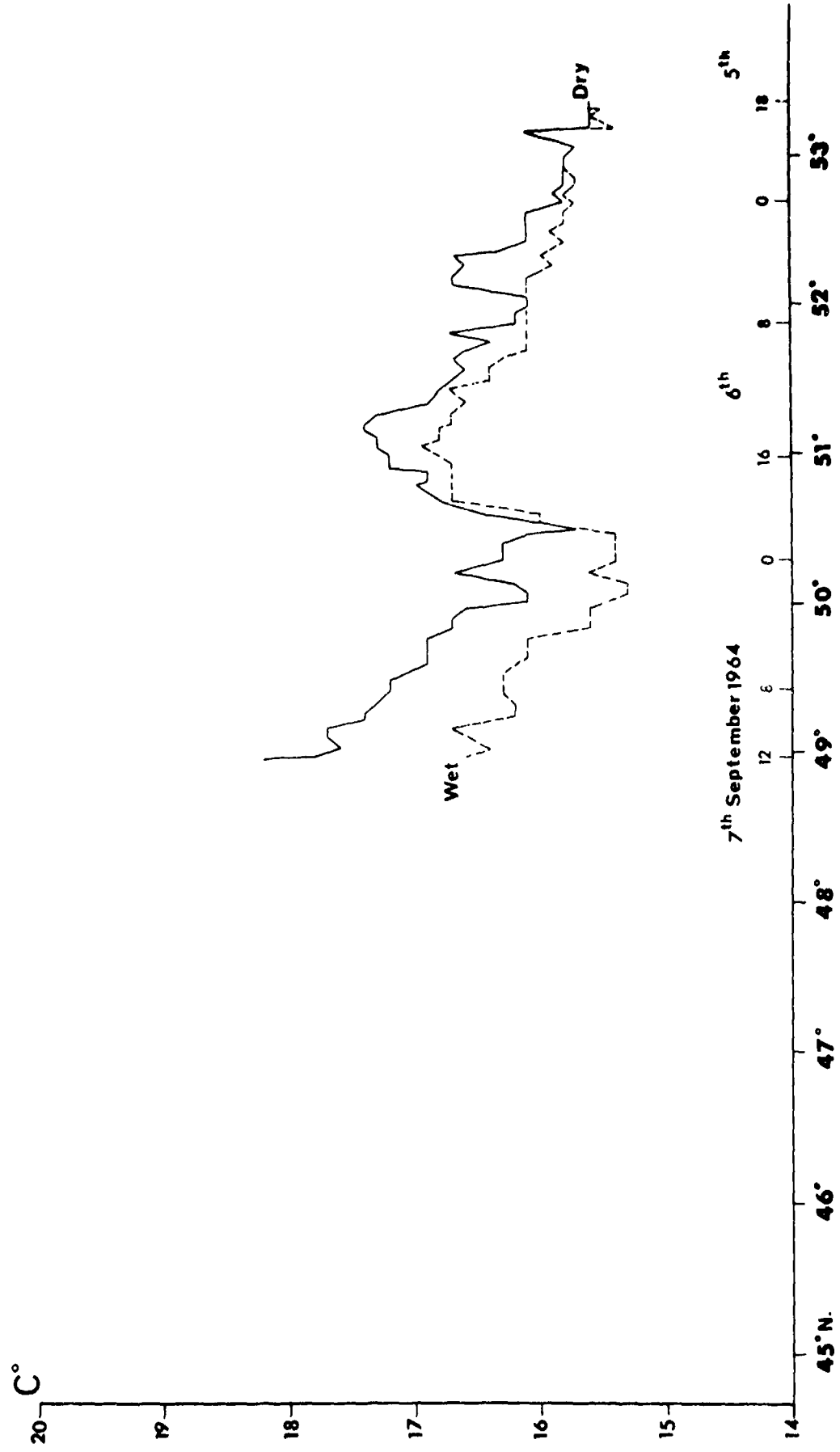


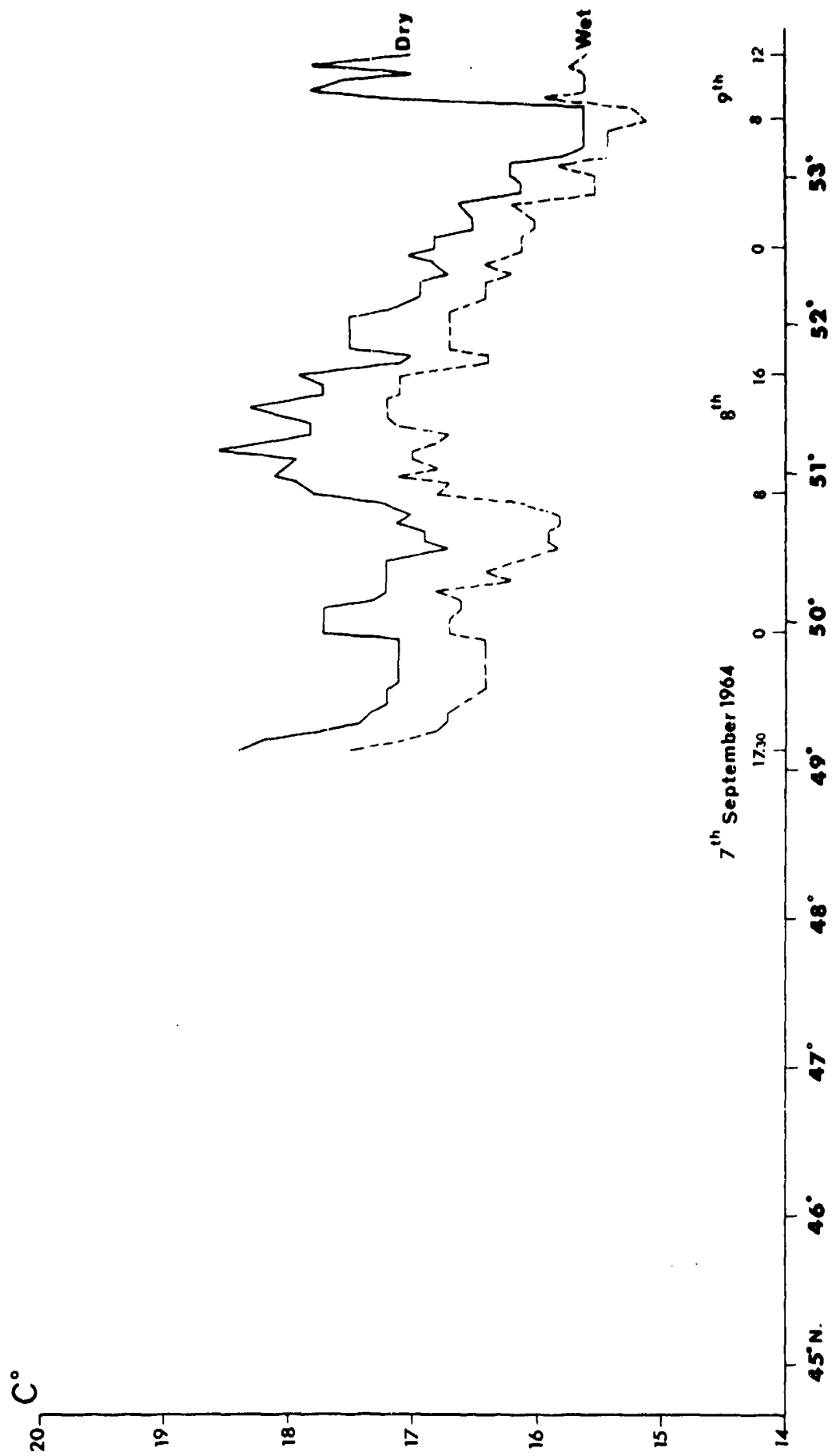
FIG. 5.16

MILOC 64

Phase A, lap 3

H.M.S. Dalrymple

Air Temperature



MILOC 64

MILOC 64

Phase A, lap 3

Air Temperature

Maria Paolina G.

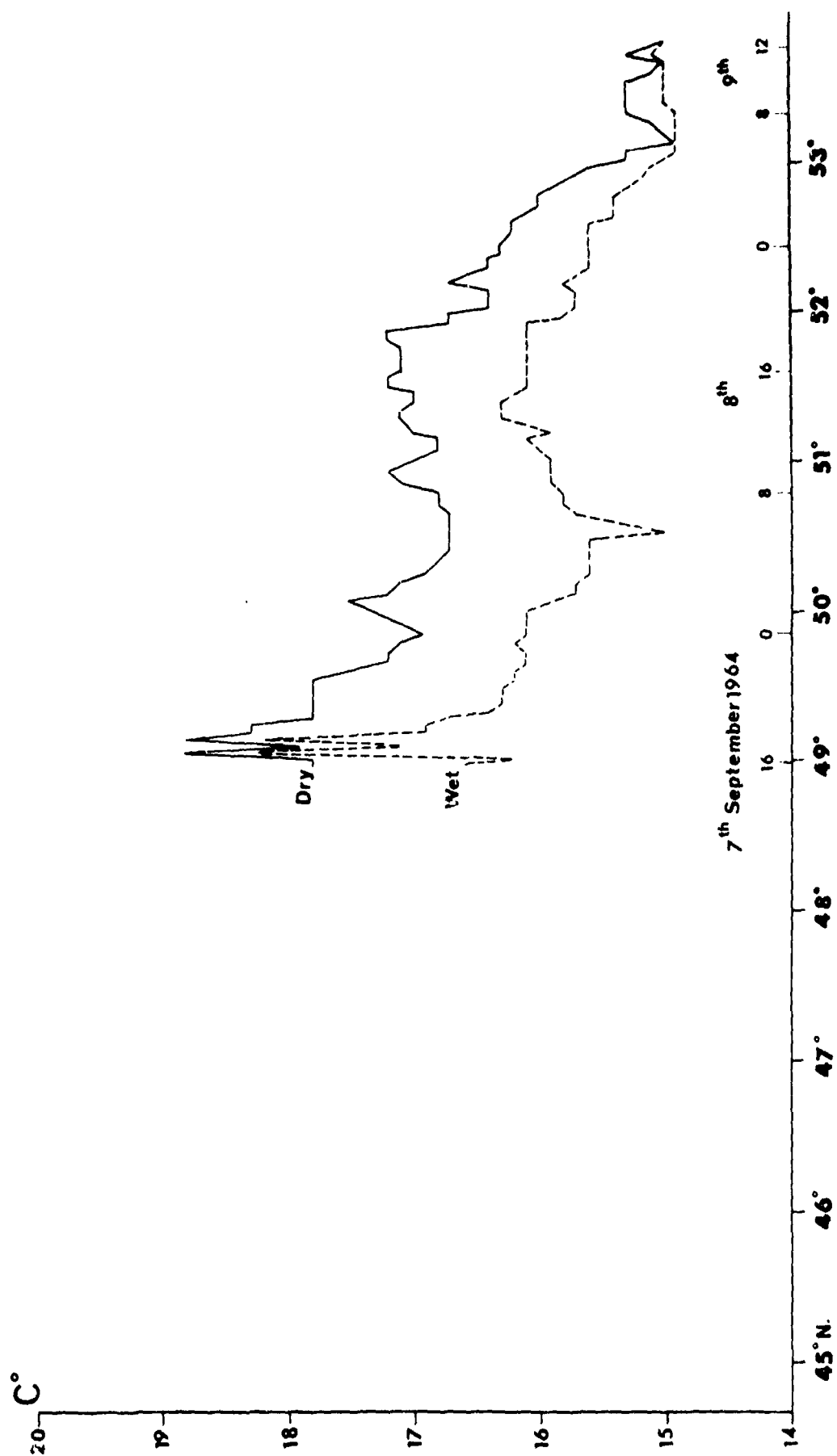


FIG. 5 18

FIG. 5.18

MILOC 64
Phase A, lap 3
Air Temperature
H.U.Sverdrup

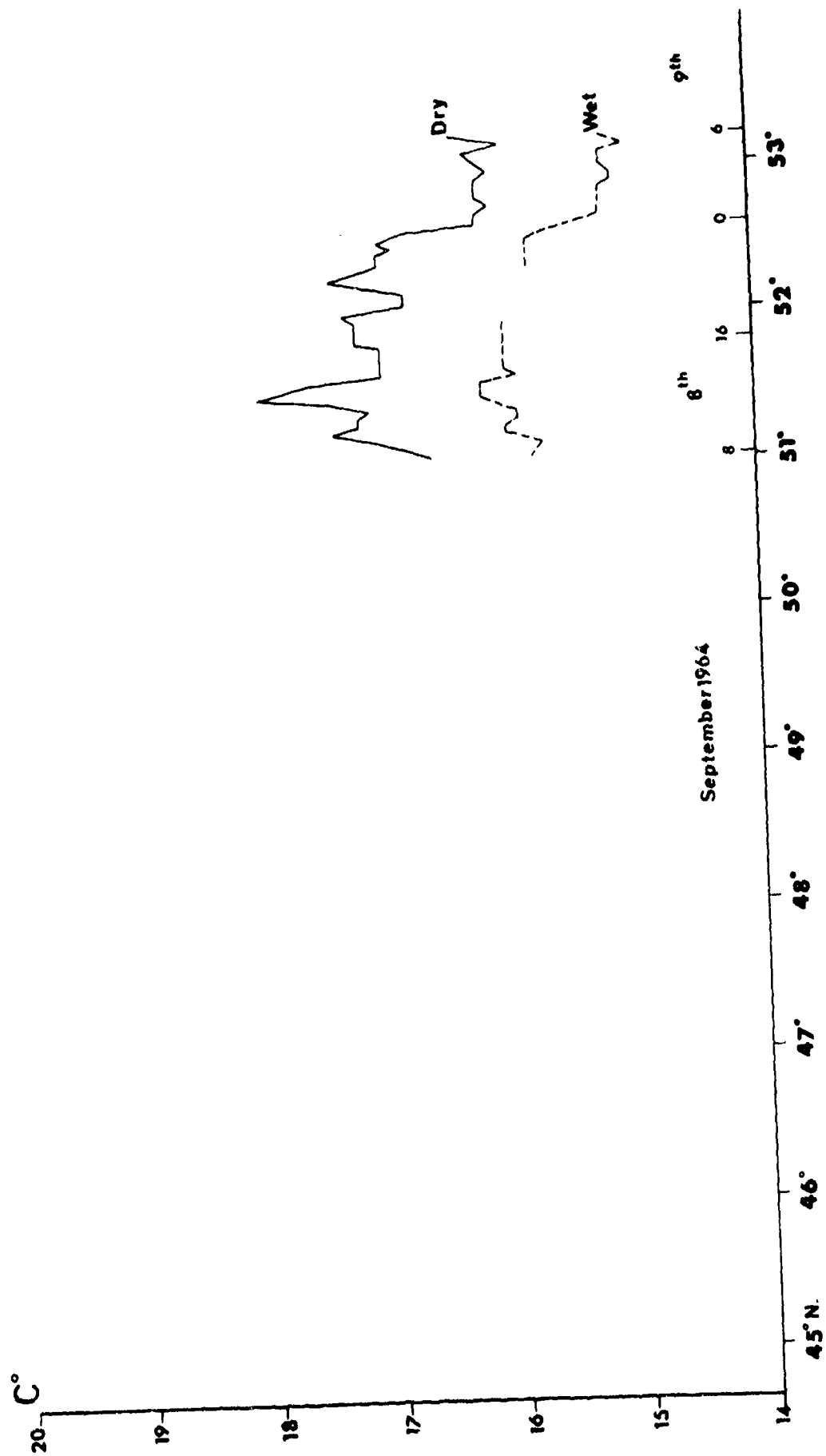


FIG. 5.19

DATA DESTROYED

MILOC 64

Phase A, lap 4

Joao de Lisboa

Air Temperature

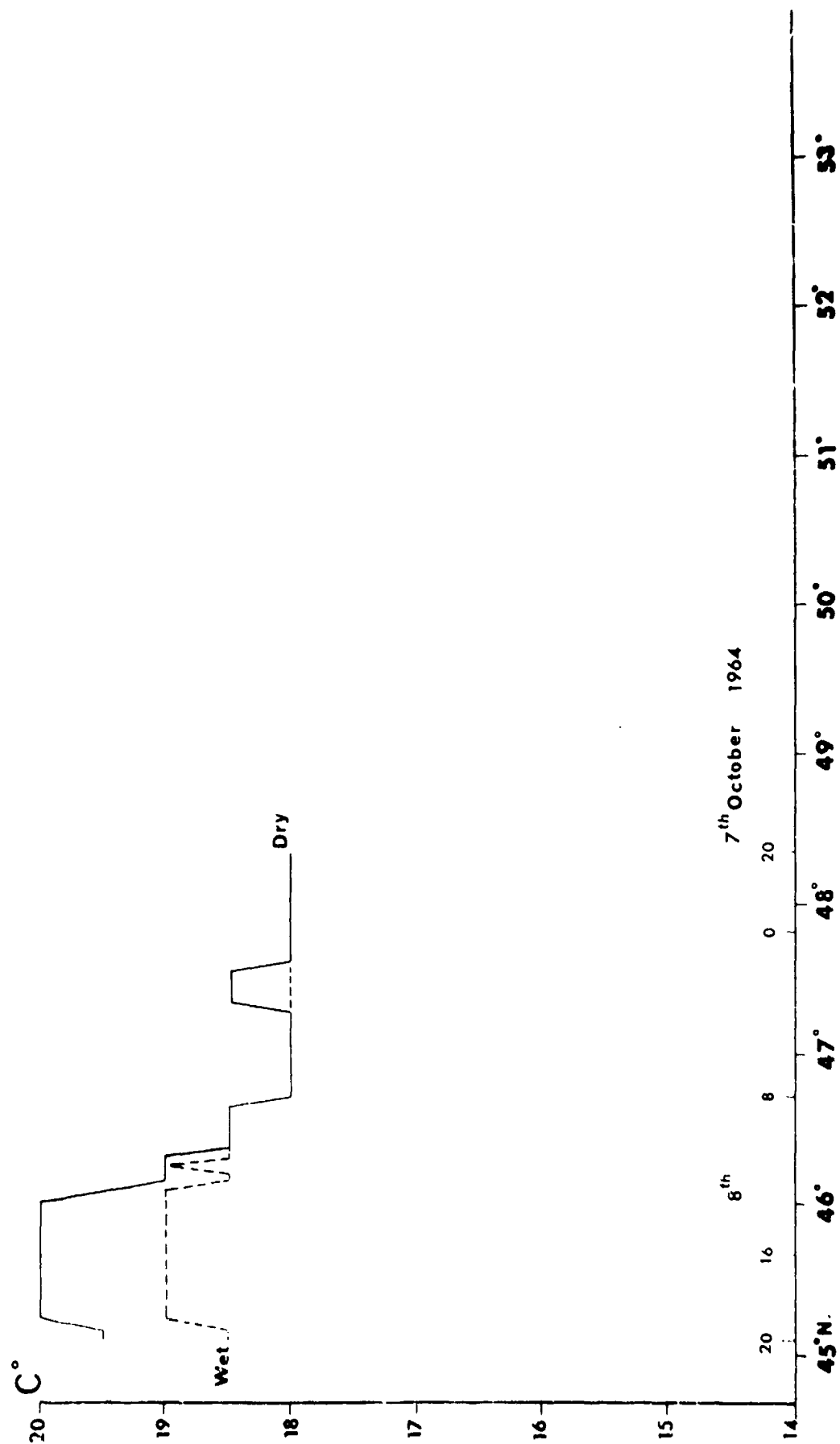


FIG. 5.20

19
C°
MILOC 64

Phase A, lap 5

Air Temperature

H.M.S. Dalrymple

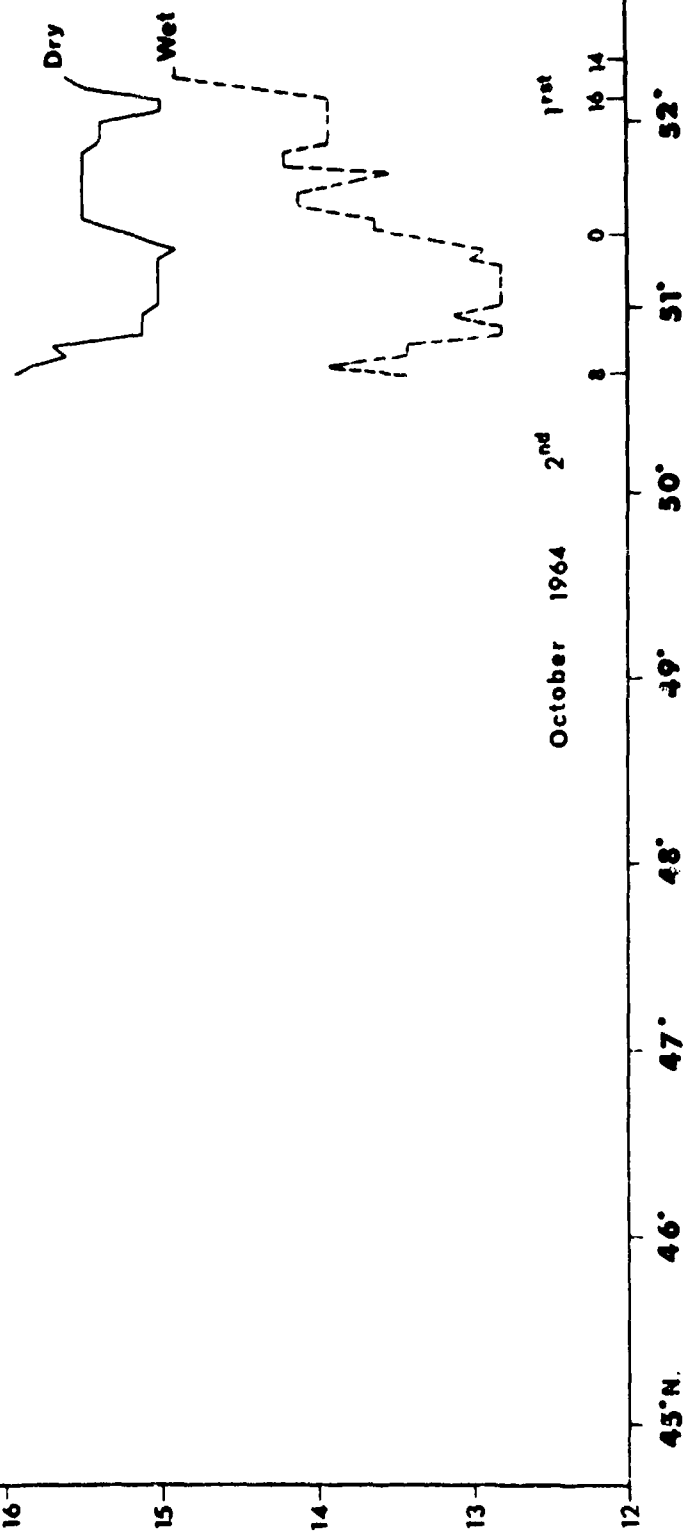


FIG. 5.21

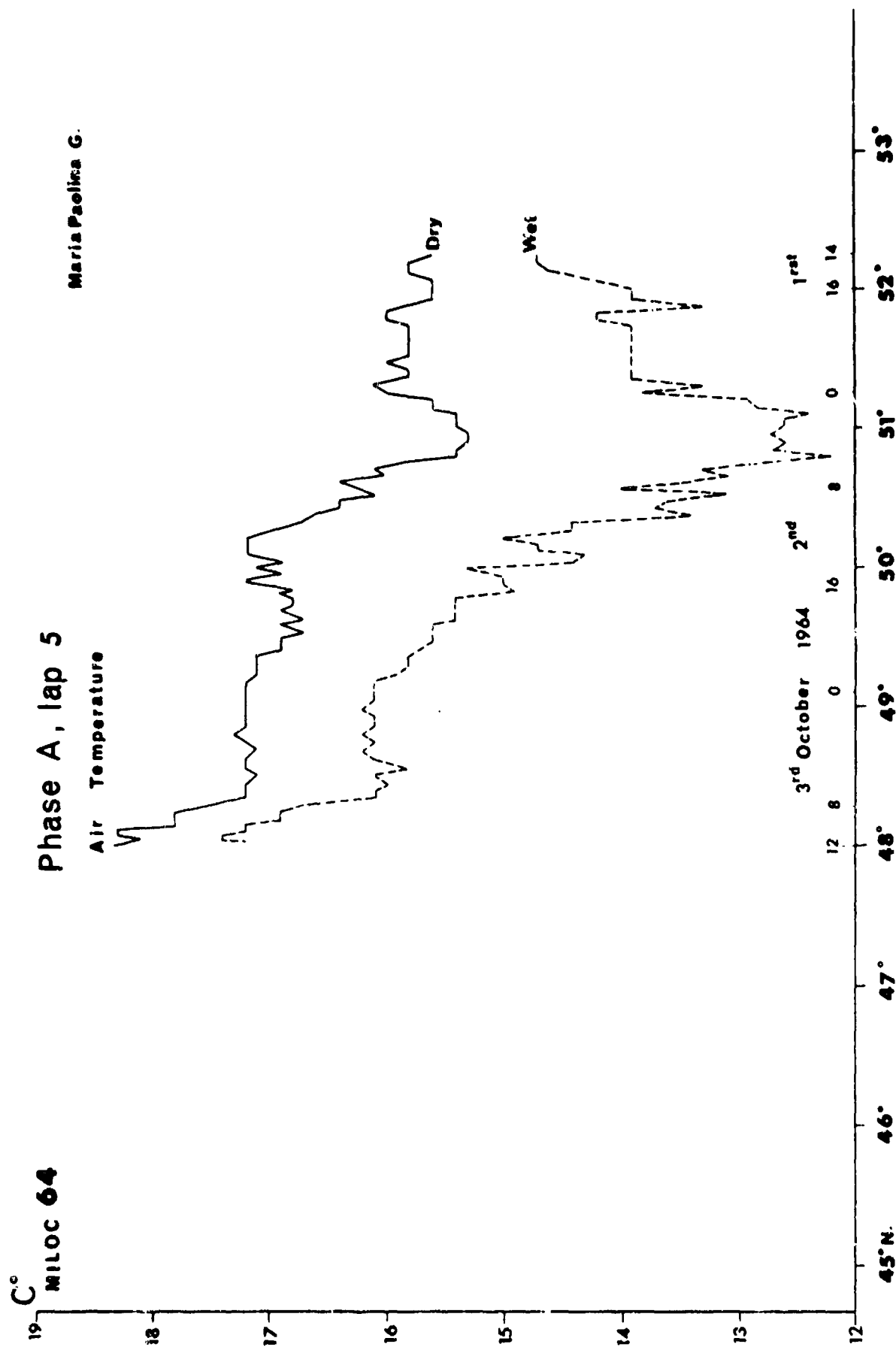


FIG. 5.22

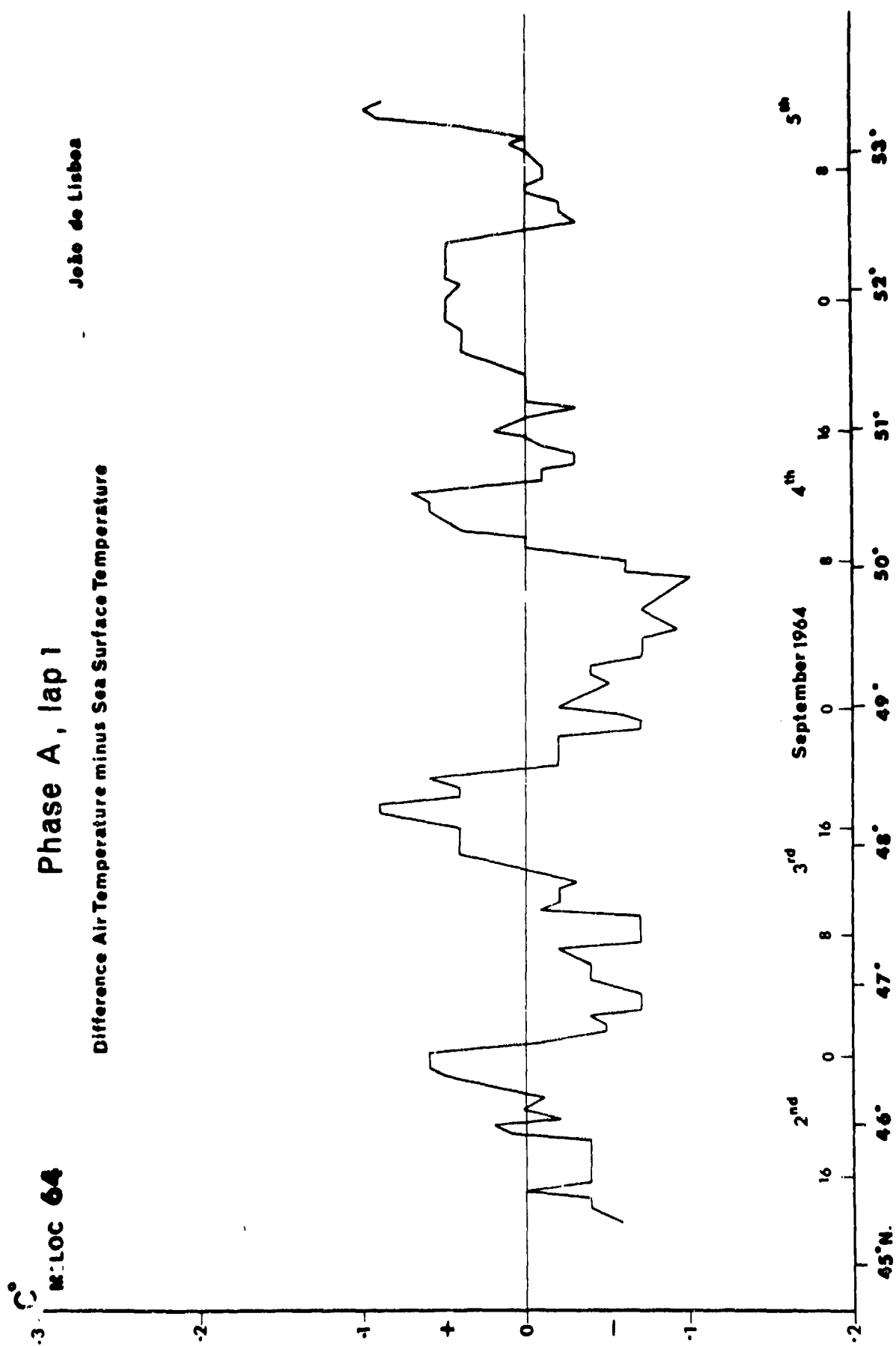


FIG. 5.23

NATO RESTRICTED

3
2
1
0
-1
-2

C° MILOC 64

Phase A, lap 1

Difference Air Temperature minus Sea Surface Temperature

H.M.S. Dalrymple

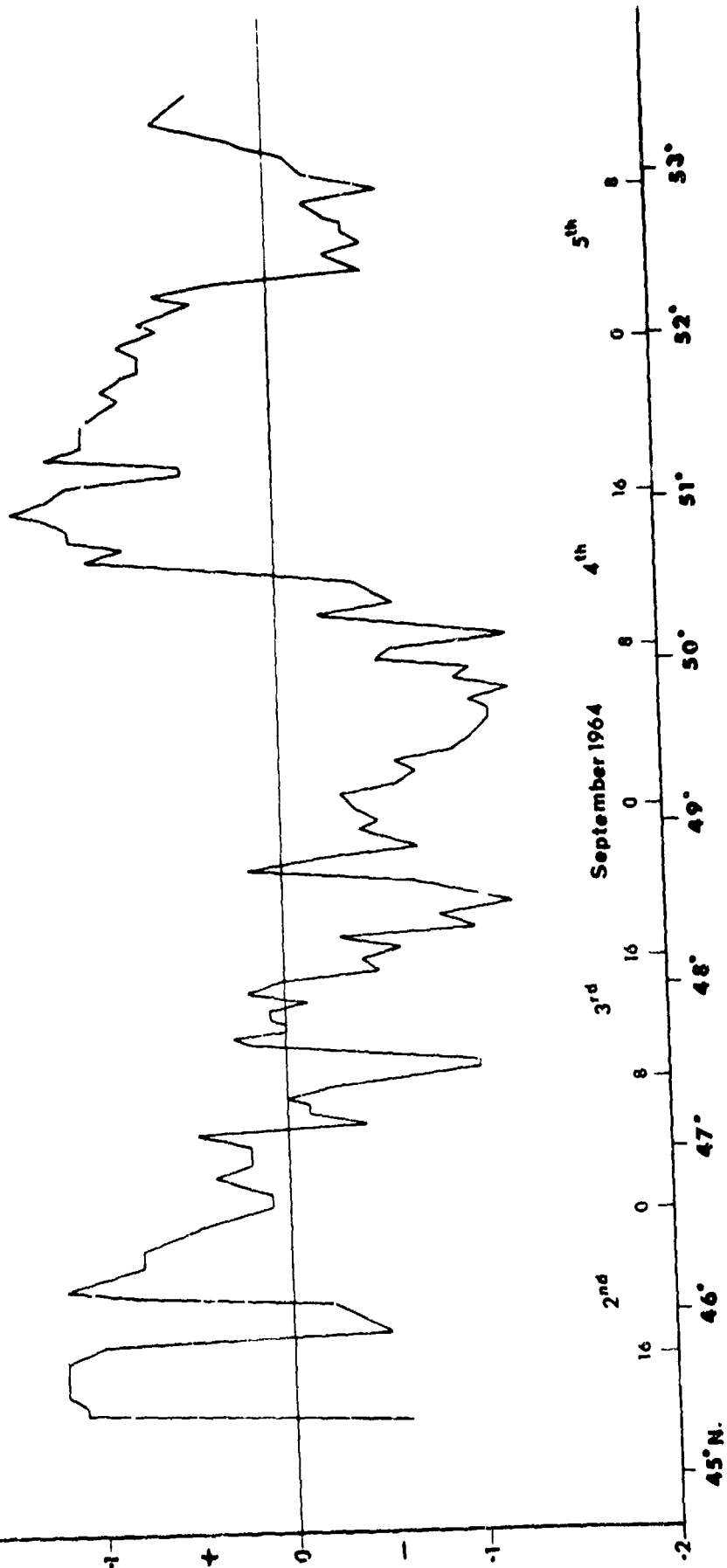


FIG. 5.24

NAVO RESTRICTED

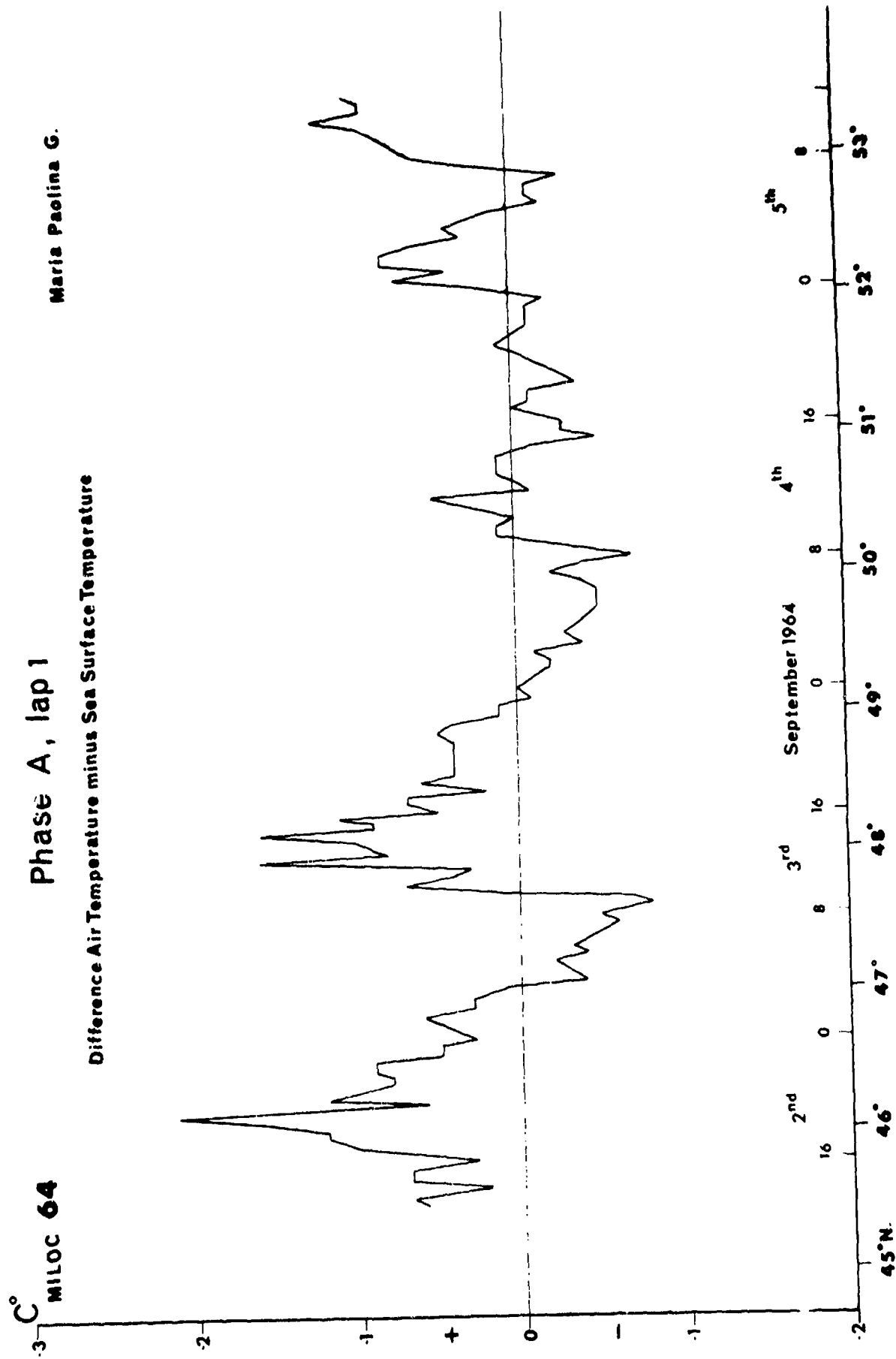


FIG. 5.25

RESTRICTED

C°
MILOC 64

Phase A, lap 2

João de Lisboa

Difference Air Temperature minus Sea Surface Temperature

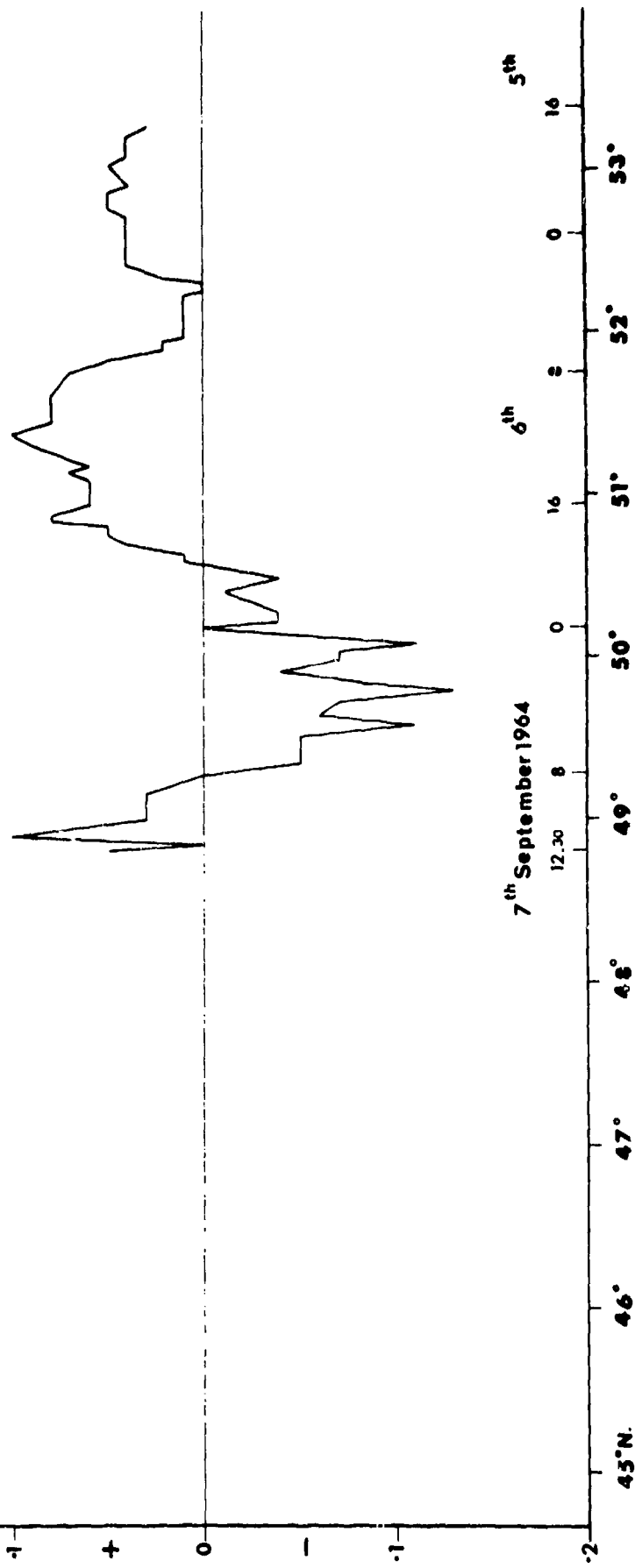


FIG. 5.26

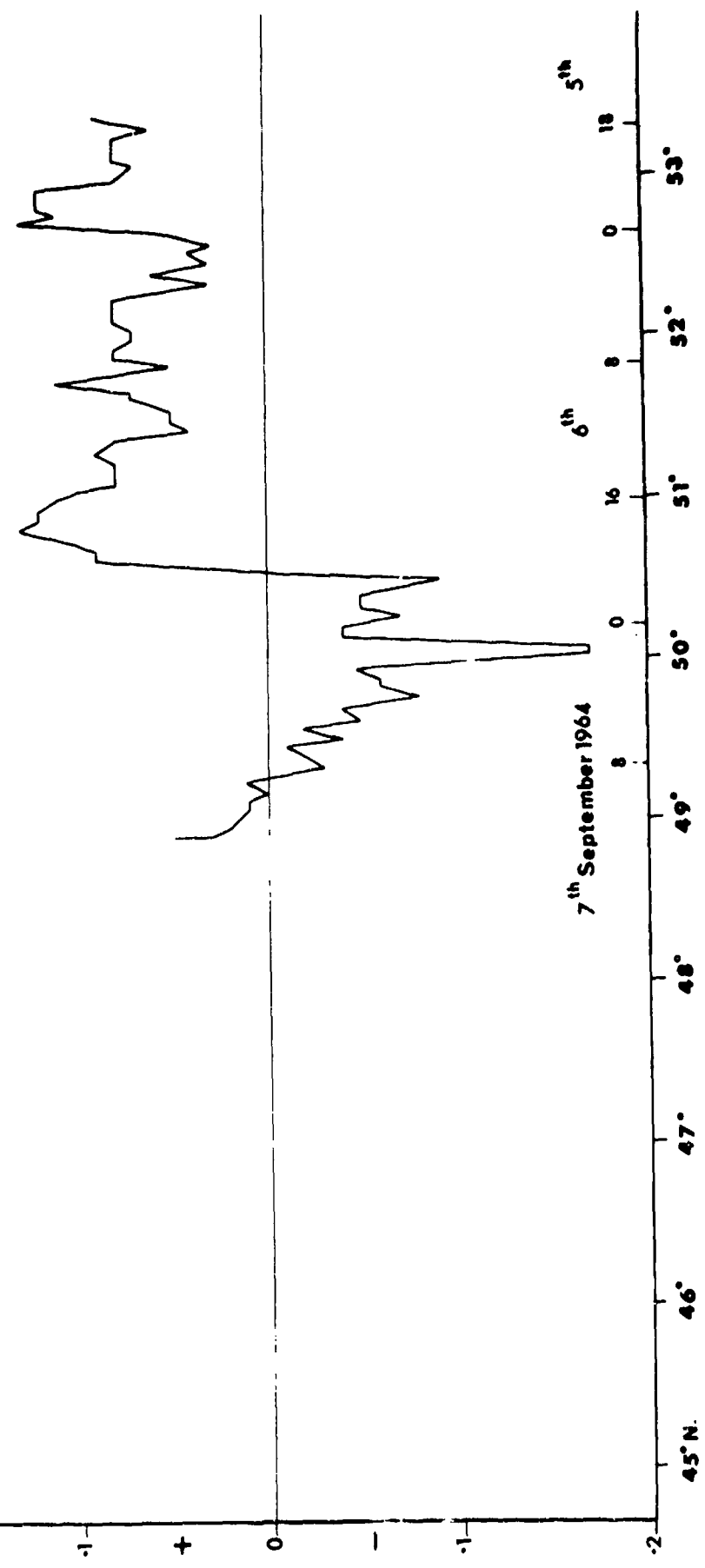
C° MILOC 64

Phase A, lap 2

H.M.S. Dalrymple

Difference Air Temperature minus Sea Surface Temperature

NATO RESTRICTED



C°
MILOC 64

Phase A, lap 2

Maria Paolina G.

Difference Air Temperature minus Sea Surface Temperature

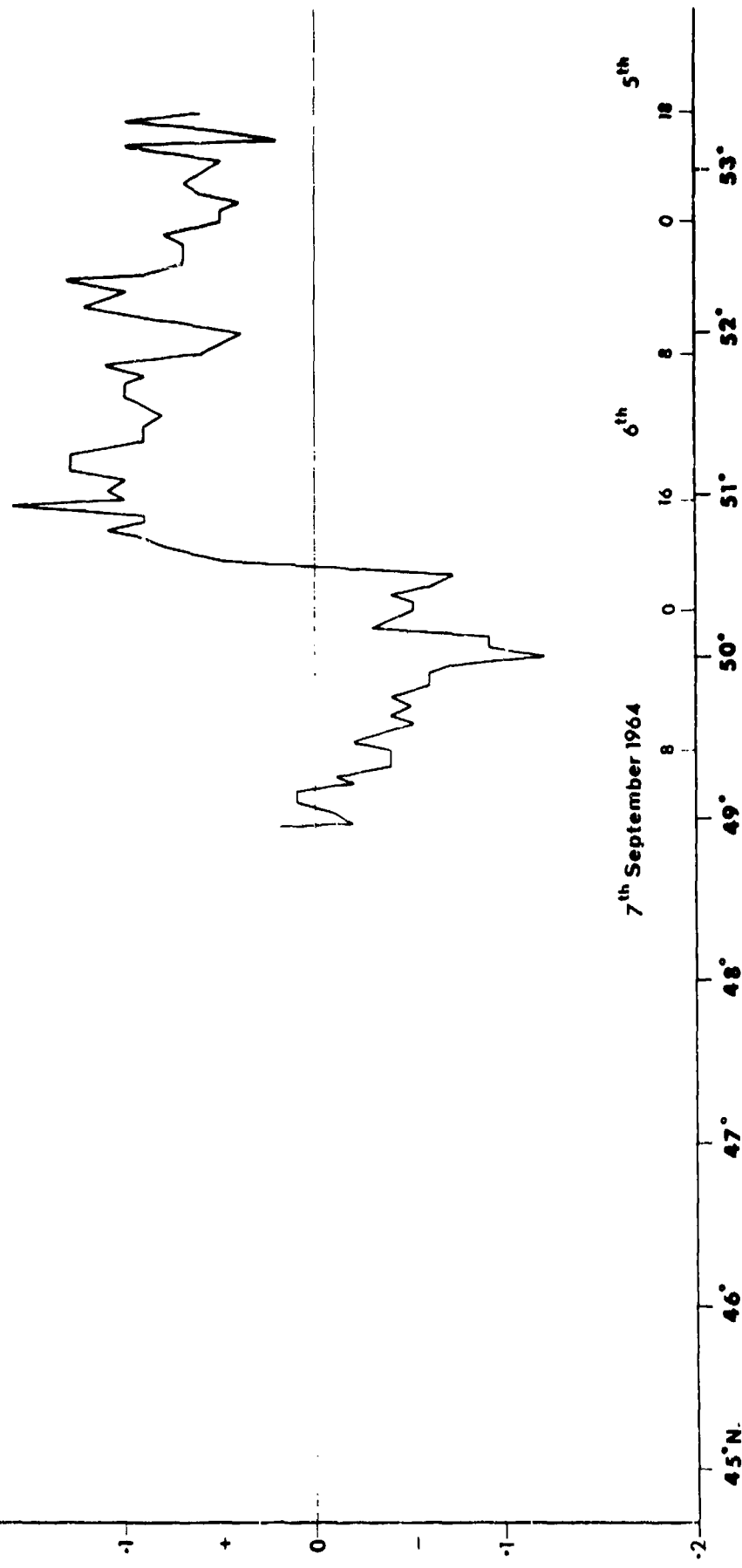


FIG. 5.28

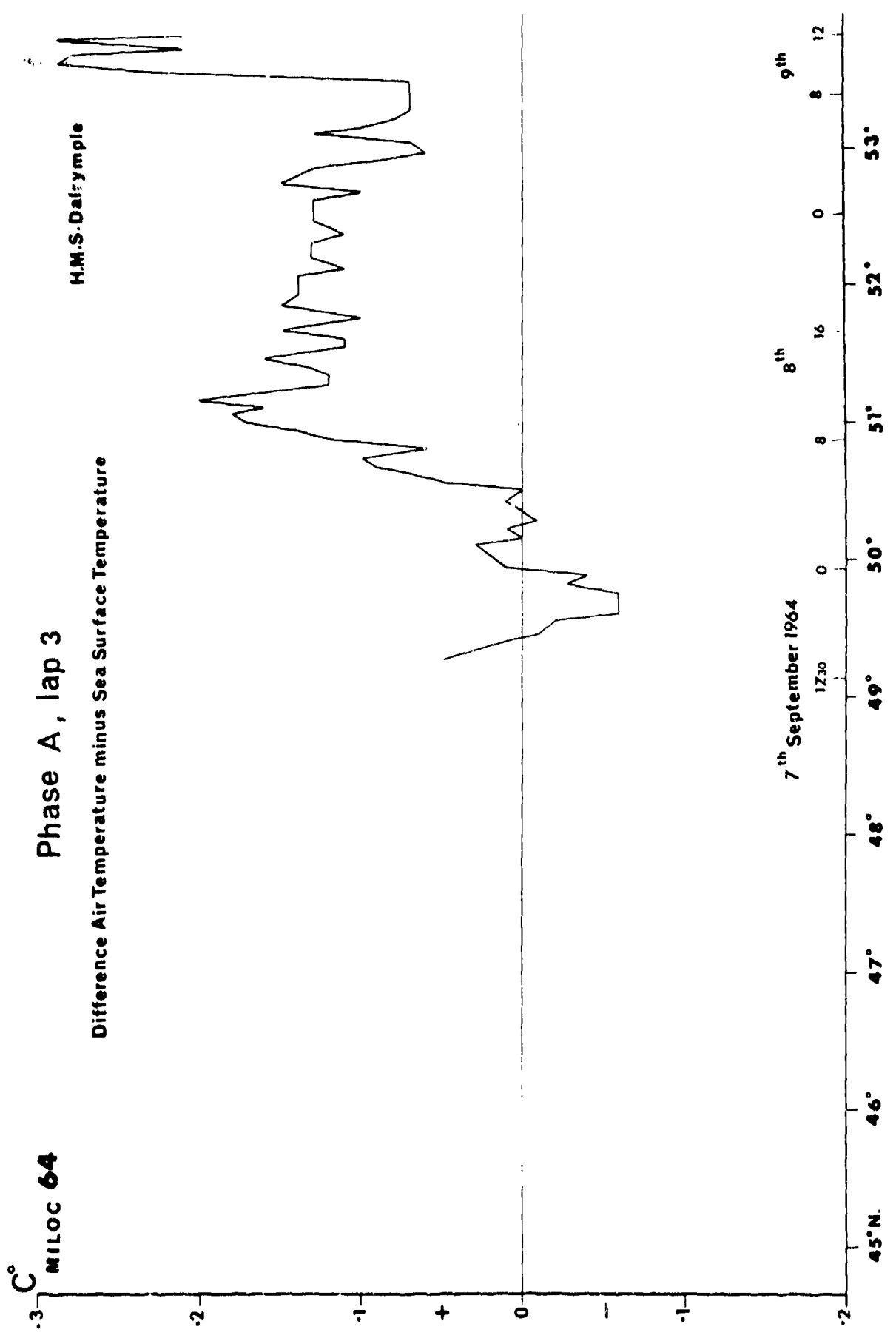
MILOC 64

C°

Phase A, lap 3

Difference Air Temperature minus Sea Surface Temperature

H.M.S. Dalrymple



1000 PM

MILOC 64
C°

Phase A, lap 3

Maria Paolina G.

Difference Air Temperature minus Sea Surface Temperature

NATO RESTRICTED

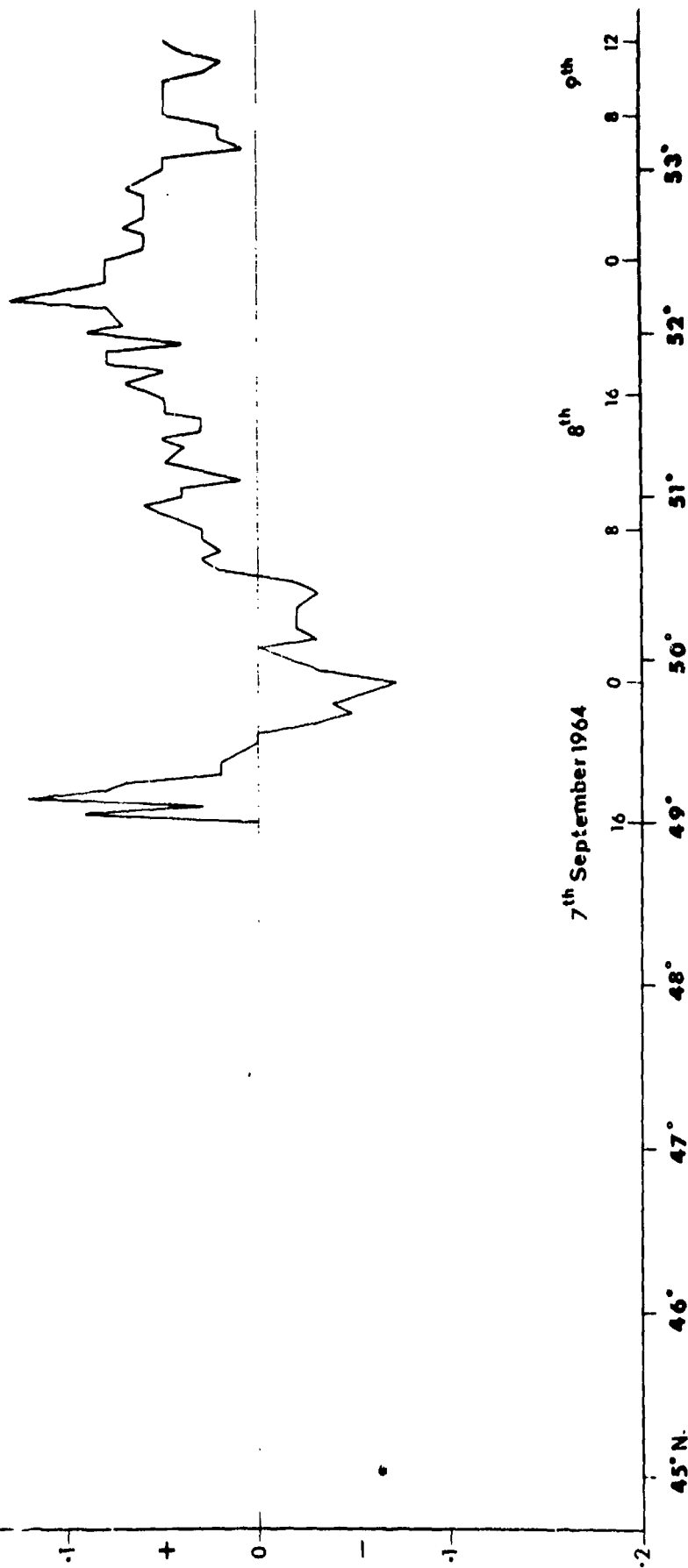


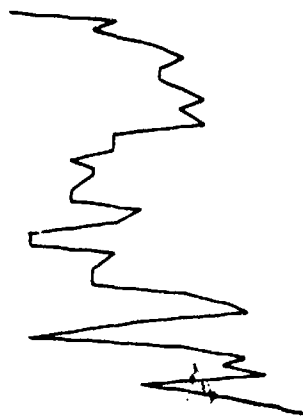
FIG. 5.30

°C
MILOC 64

Phase A, lap 3

H.U. Sverdrup

Difference Air Temperature minus Sea Surface Temperature

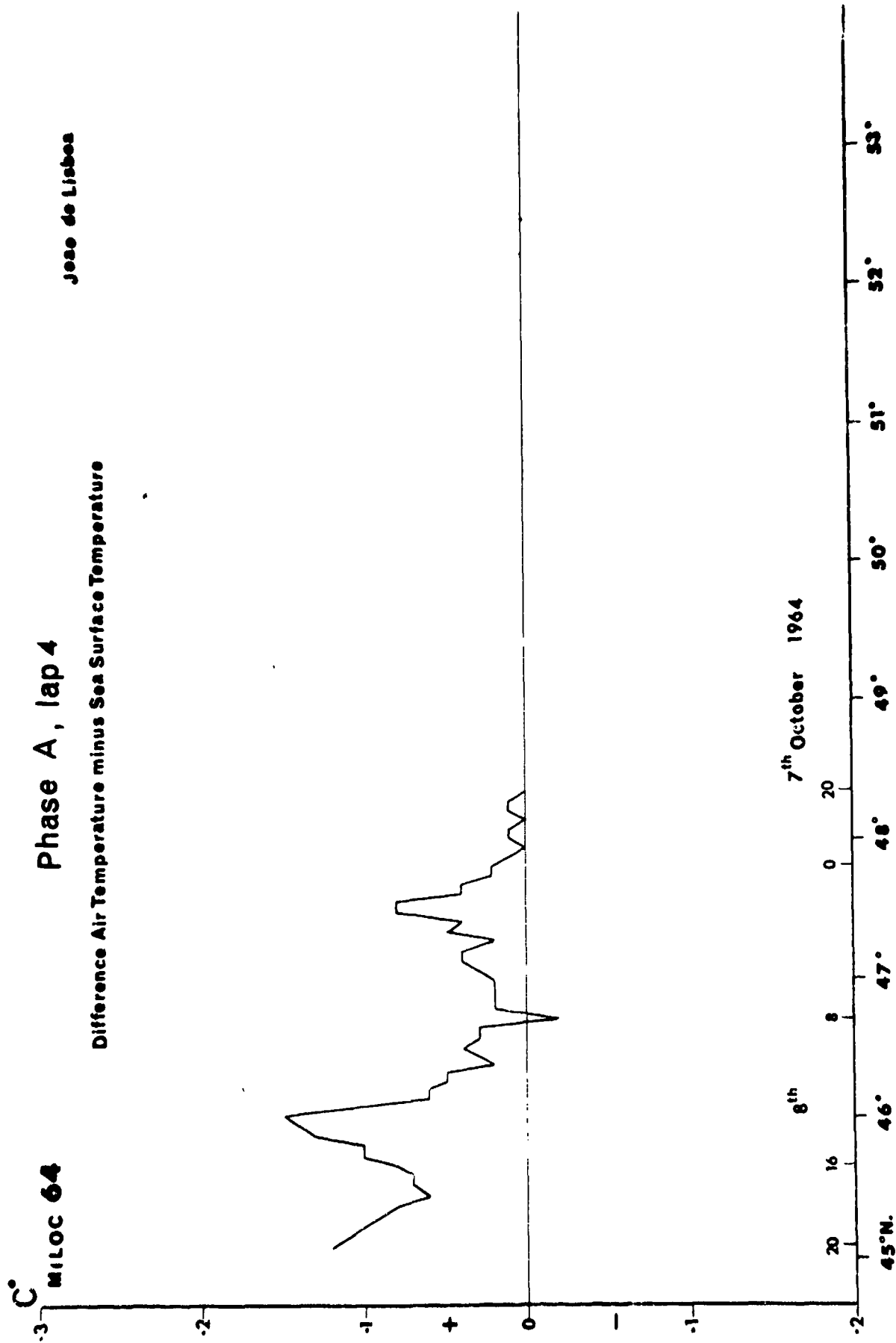


September 1964

9th

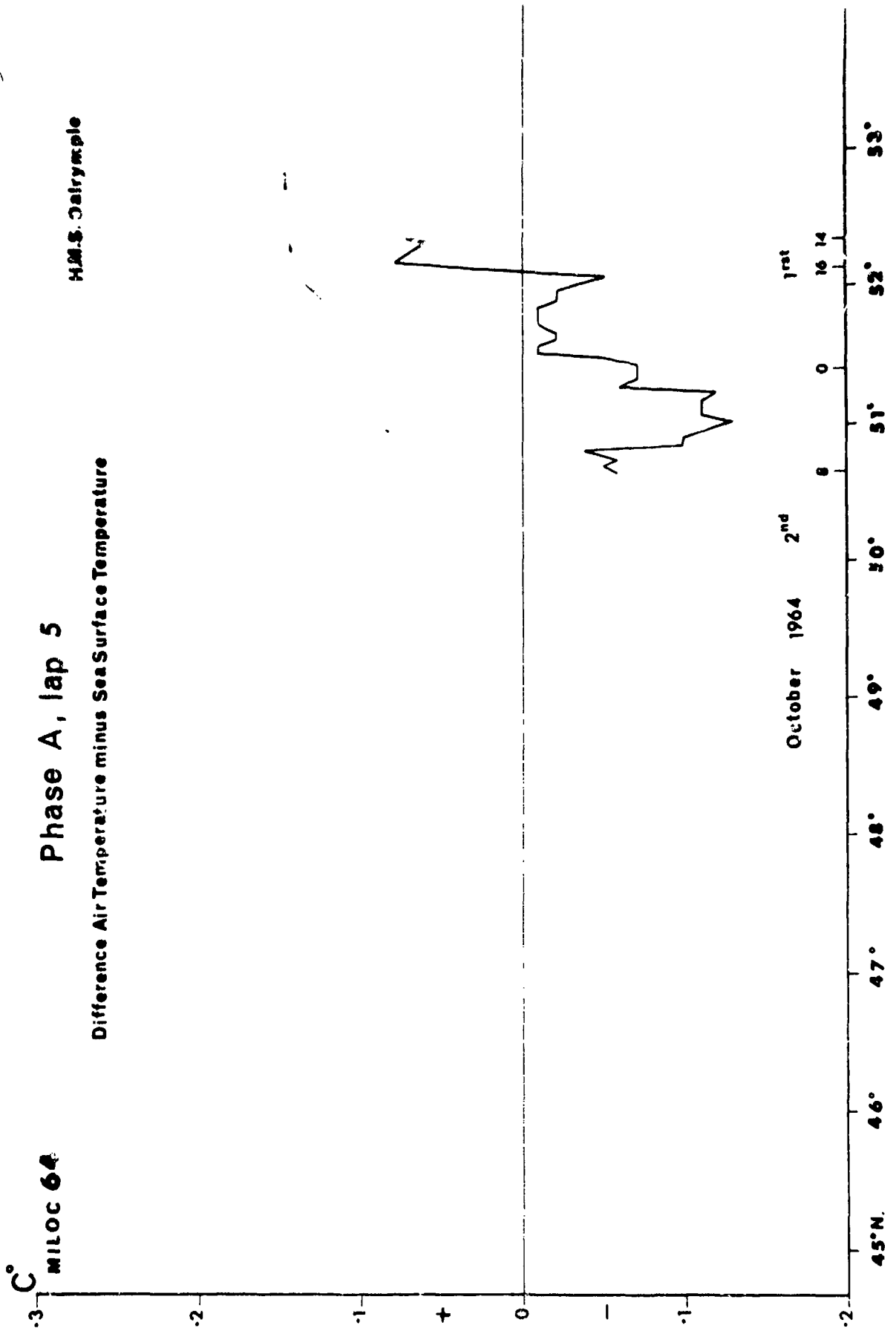
45°N. 46° 47° 48° 49° 50° 51° 52° 53°

NATO RESTRICTED



ENC 5 17

MILOC 64
Phase A, lap 5
Difference Air Temperature minus Sea Surface Temperature
H.M.S. Calymple



NATO RESTRICTED

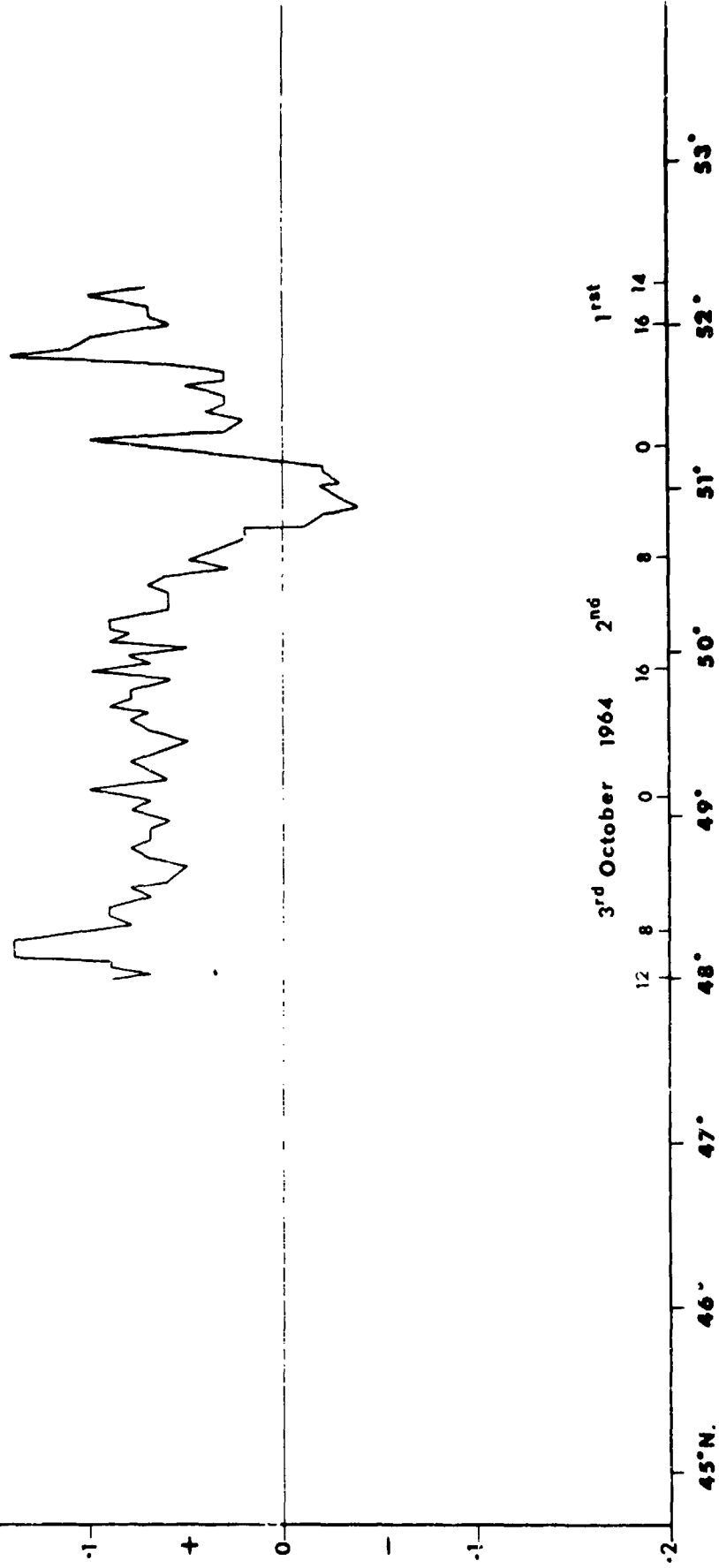
NATO RESTRICTED

°C
MILOC 64

Phase A, lap 5

Difference Air Temperature minus Sea Surface Temperature

Maria Paolina G.



MILOC 64

512 739

NATO RESTRICTED

MILOC 64

Phase A, lap 1

João de Lisboa

Evaporation

4 m.m.

3

2

+1

0

-1

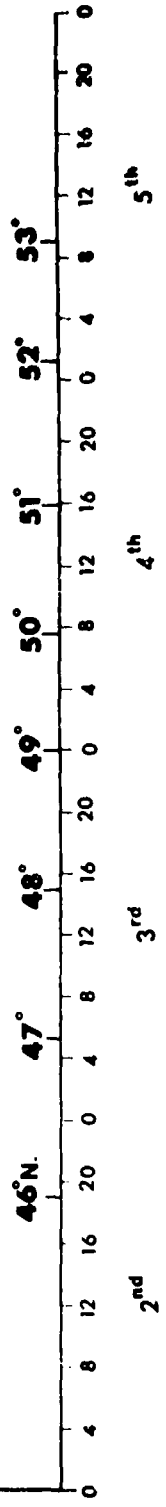


FIG. 5.35

NATO RESTRICTED

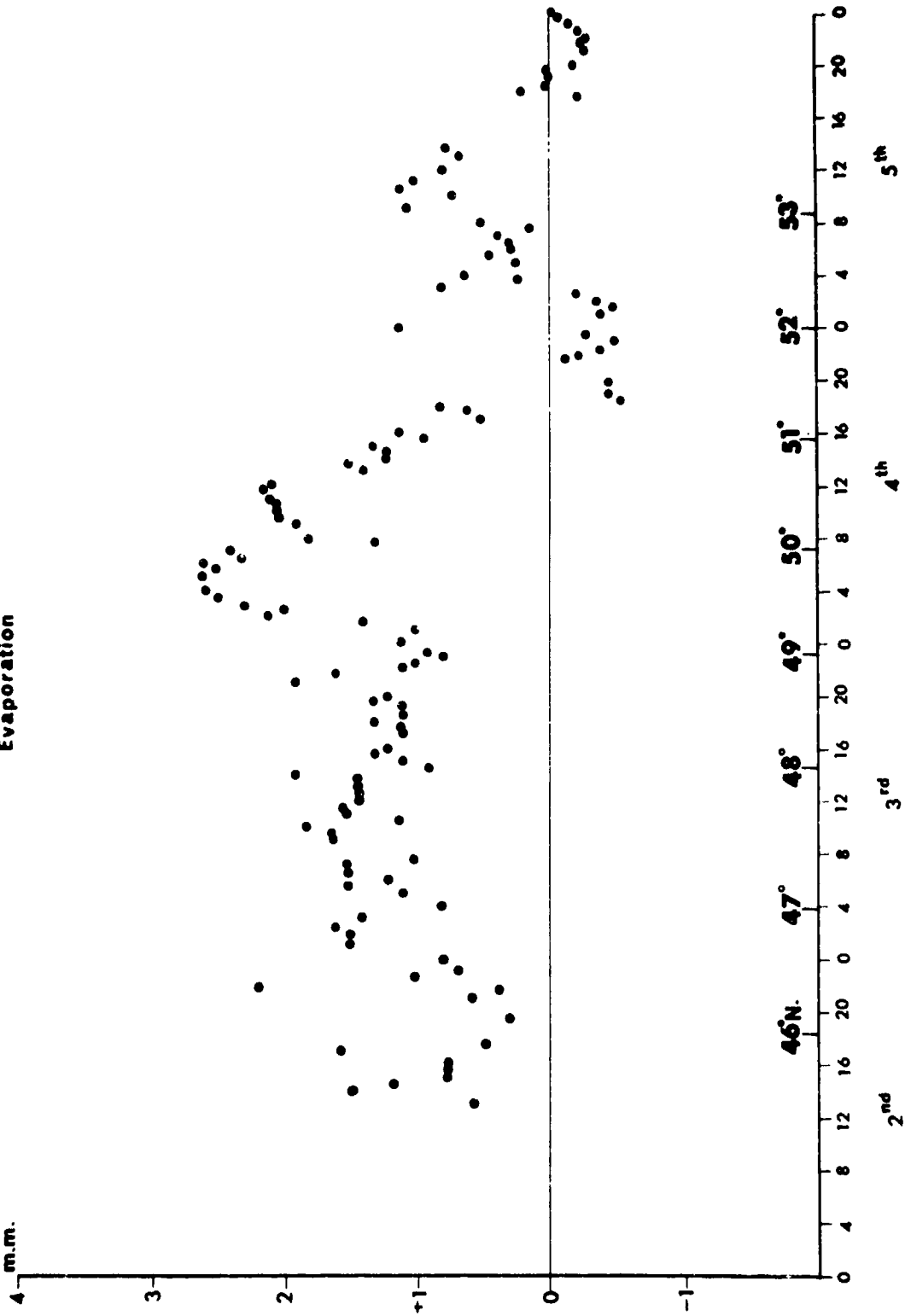
MILOC 64

Phase A, lap 1

H.M.S. Dairymple

Evaporation

4 m.m.



NATO RESTRICTED

MILOC 64

Phase A, lap 1

Maria Paolina G.

Evaporation

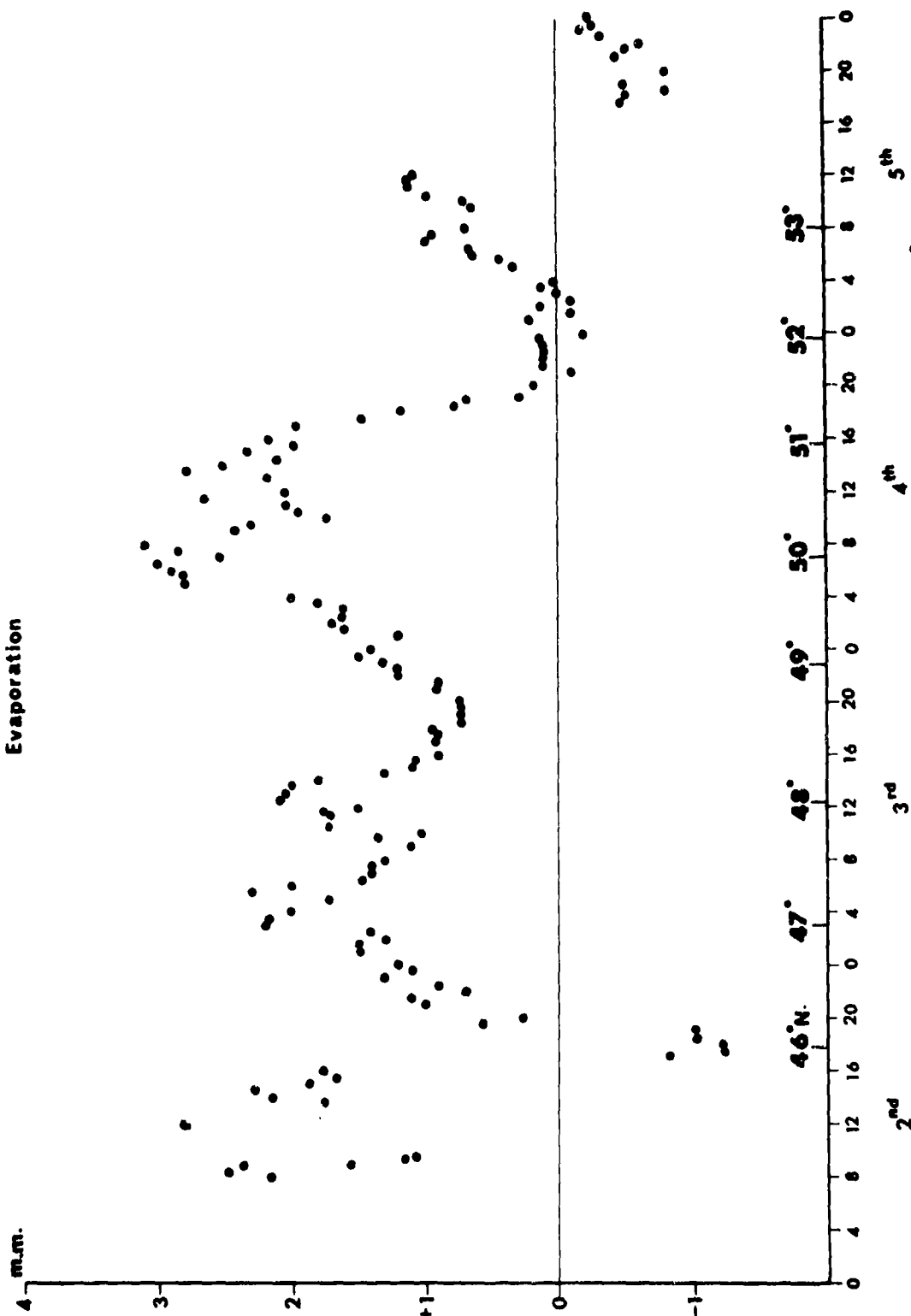


FIG. 2.97

PLATE 5.38

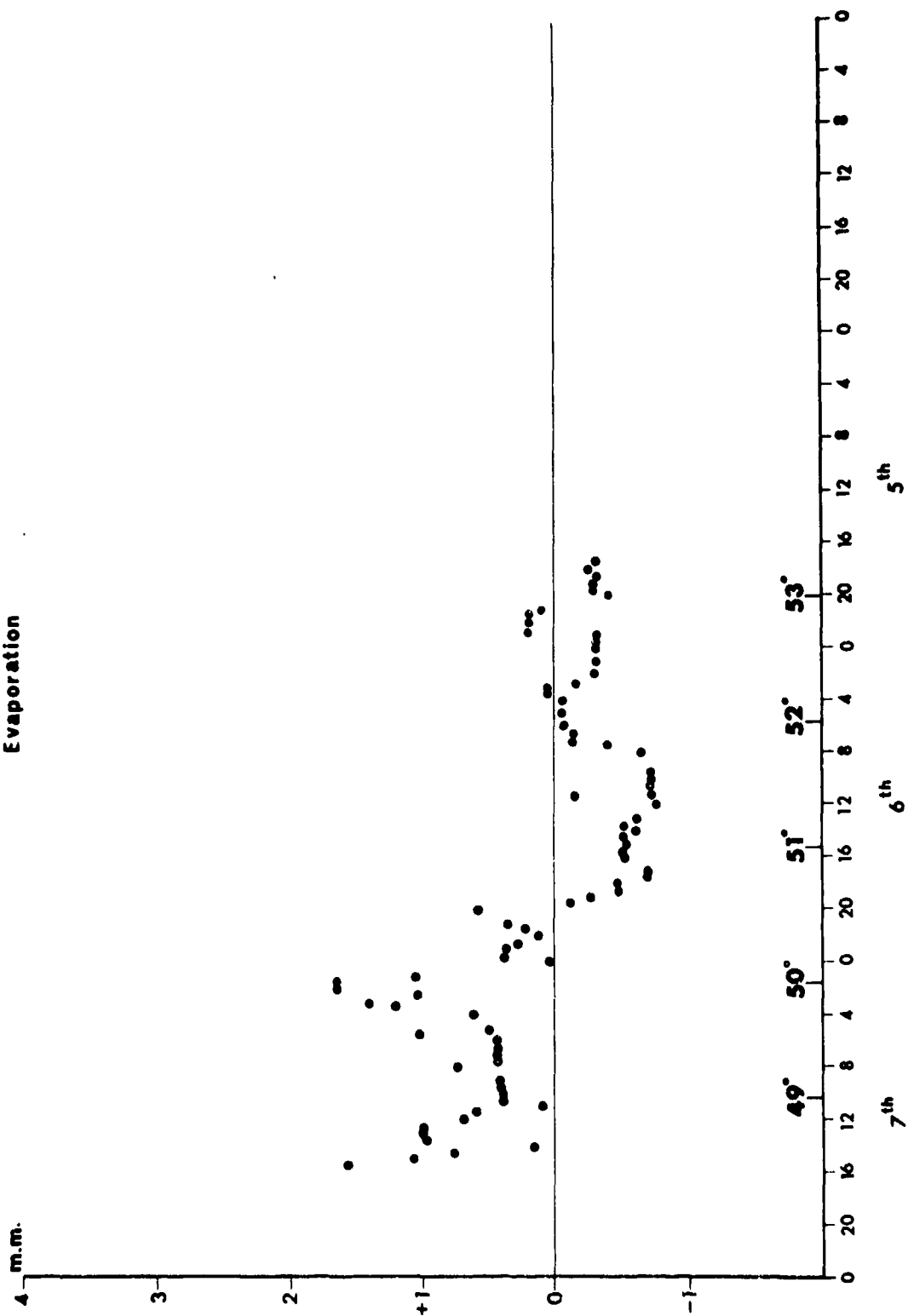
NATO RESTRICTED

MILOC 64

Phase A, lap 2

João de Lisboa

Evaporation



September 1964

FIG 5.38

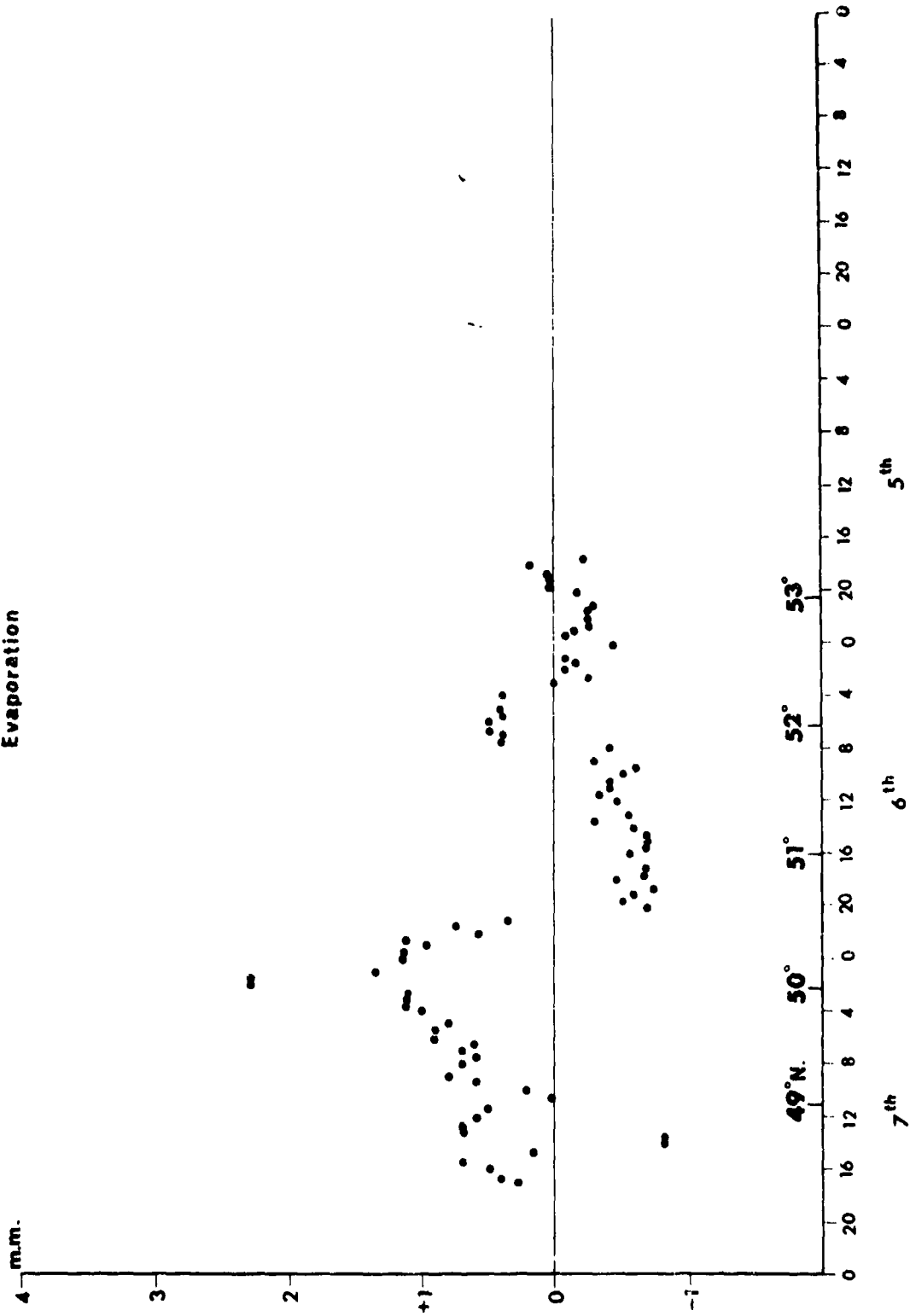
NATO RESTRICTED

MILOC 64

Phase A, lap 2

H.M.S. Dalrymple

Evaporation



September 1964

FIG. 5.39

NATO RESTRICTED

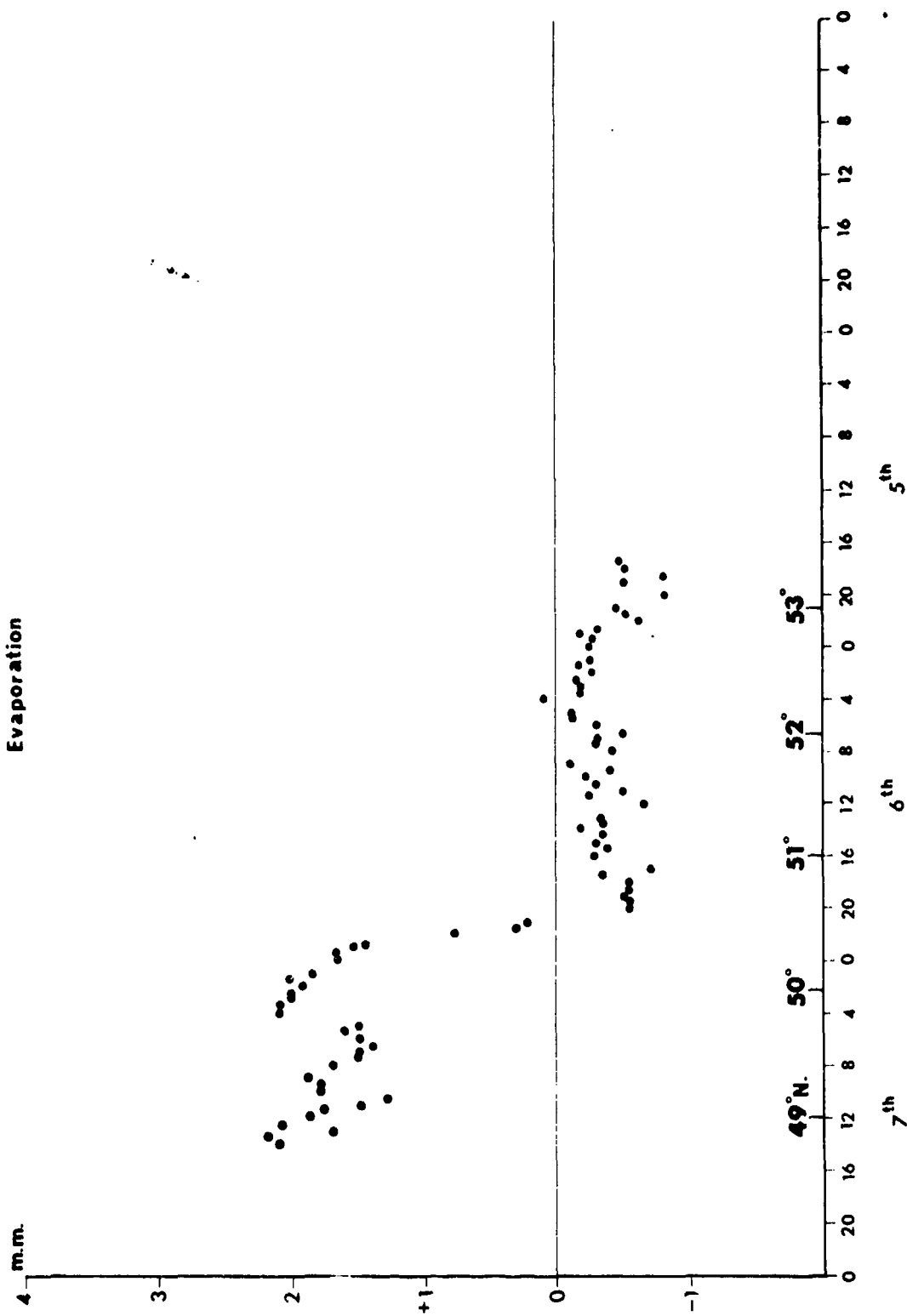
MILOC 64

Phase A, lap 2

Maria Paolina G.

Evaporation

4 m.m.



NATO RESTRICTED

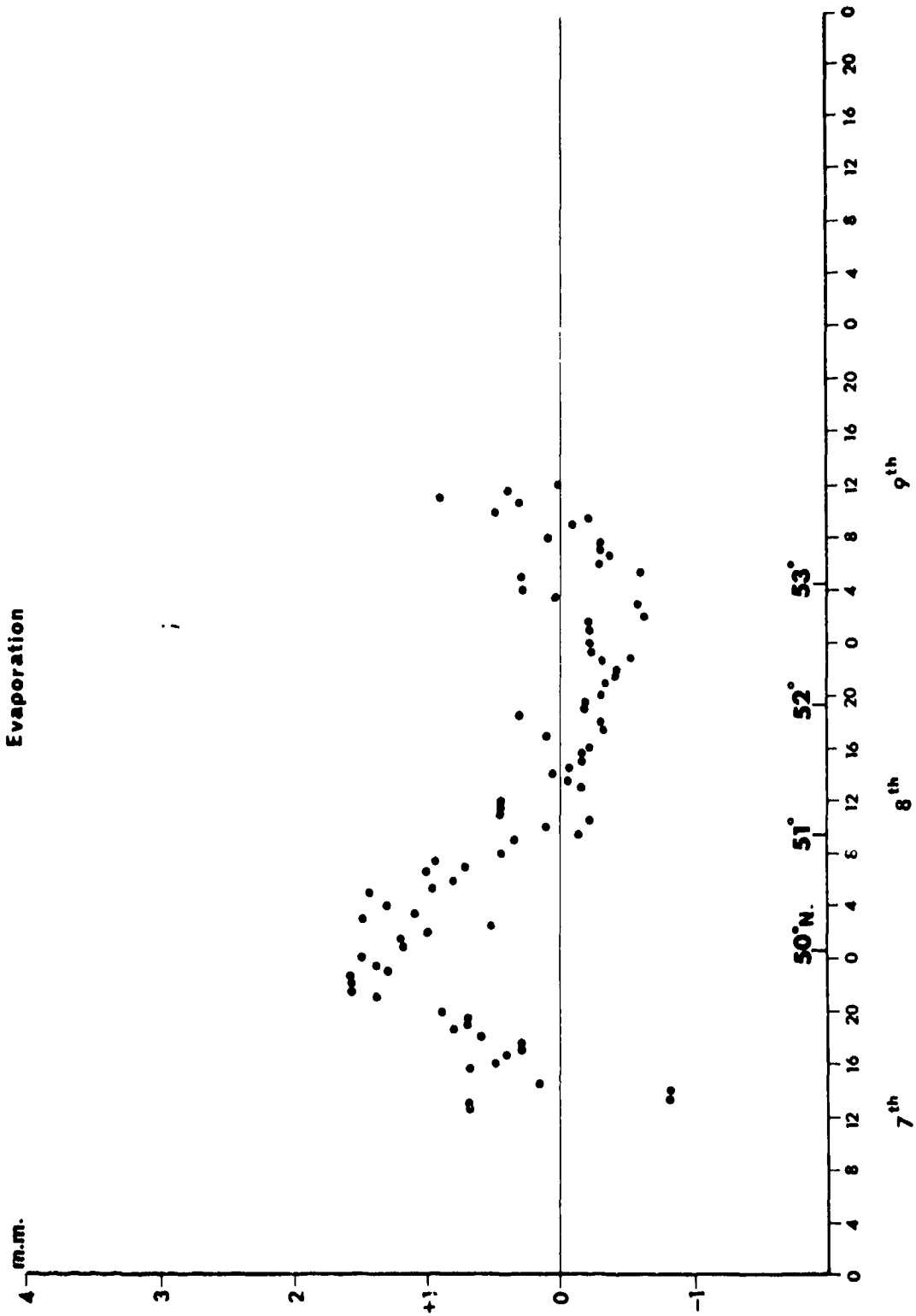
MILOC 64

Phase A, lap 3

H.M.S. Dairymple

Evaporation

4 m.m.



ENC 541

FIG 5.41

NATO RESTRICTED

MILOC 64

Phase A, lap 3

Maria Paolina G.

Evaporation

4 m.m.

3

2

+1

0

-1

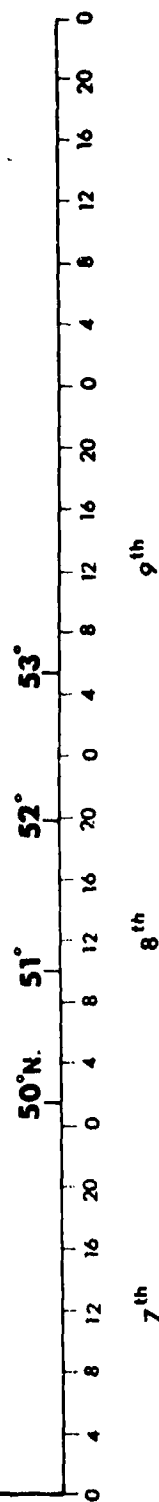
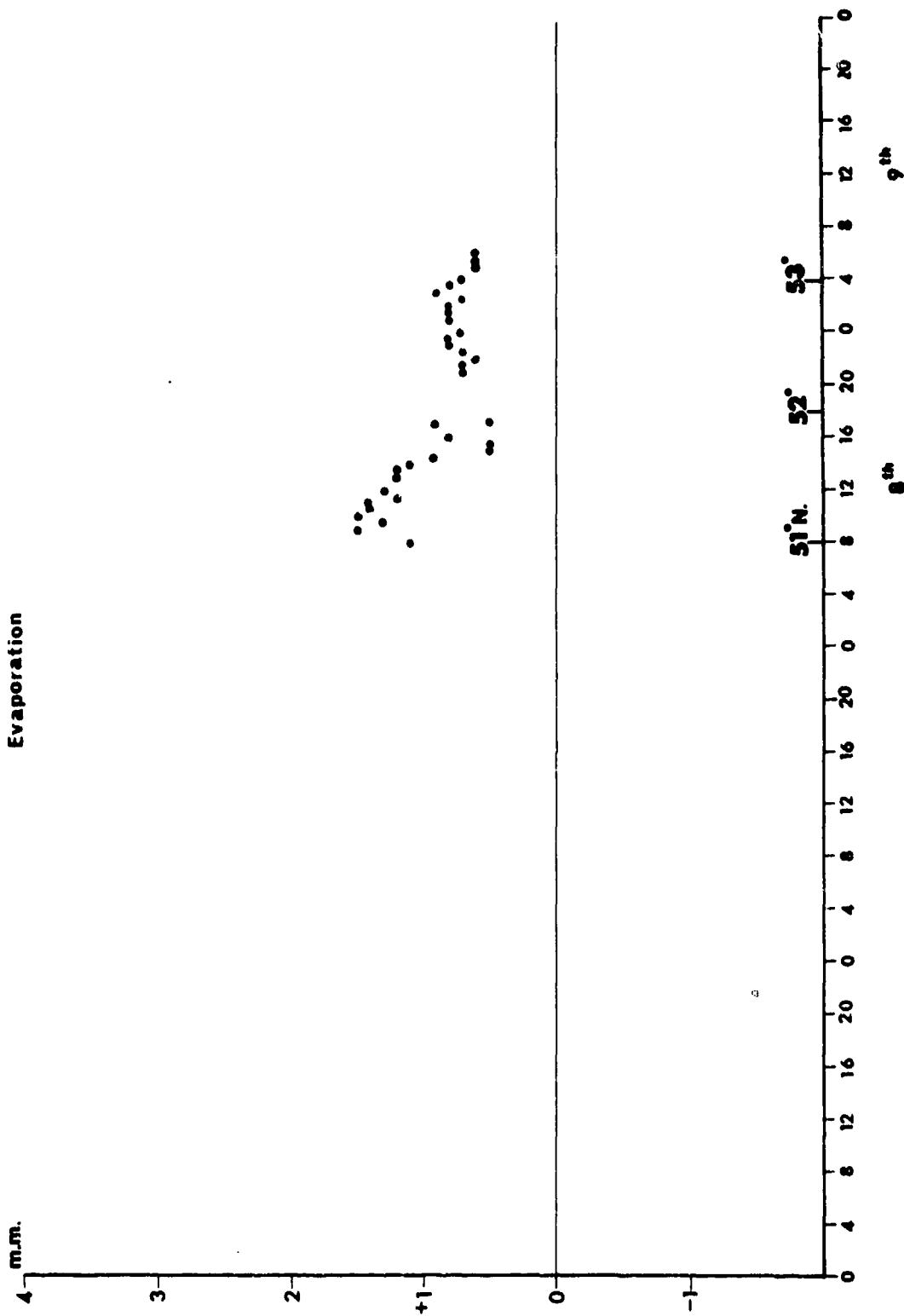


FIG 5.42

NATO RESTRICTED

MILOC 64
Phase A, lap 3
Evaporation
H.U. Sverdrup



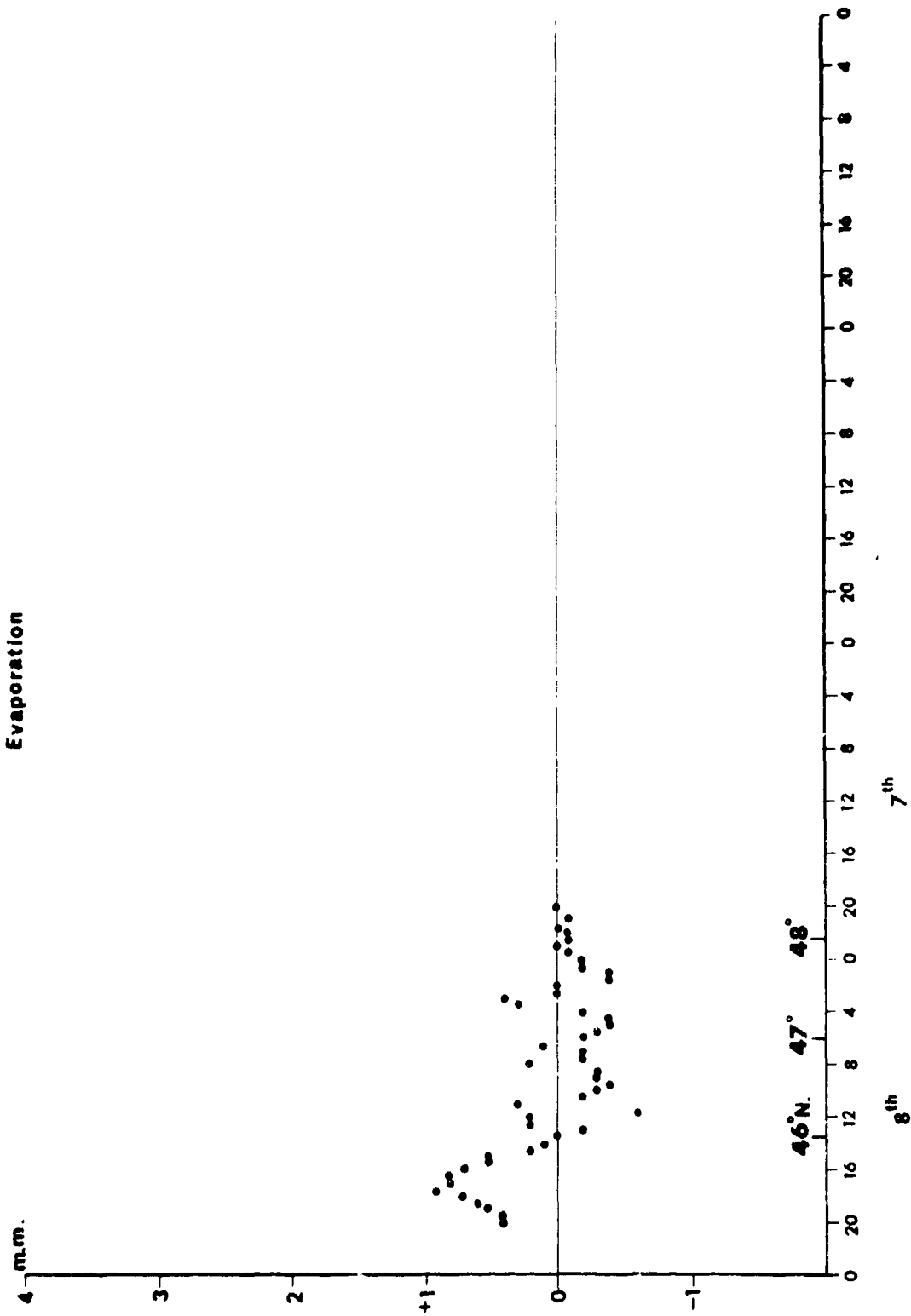
NATO RESTRICTED

MILOC 64

Phase A, lap 4

João de Lisboa

Evaporation



7th
September 1964

FIG. 5.44

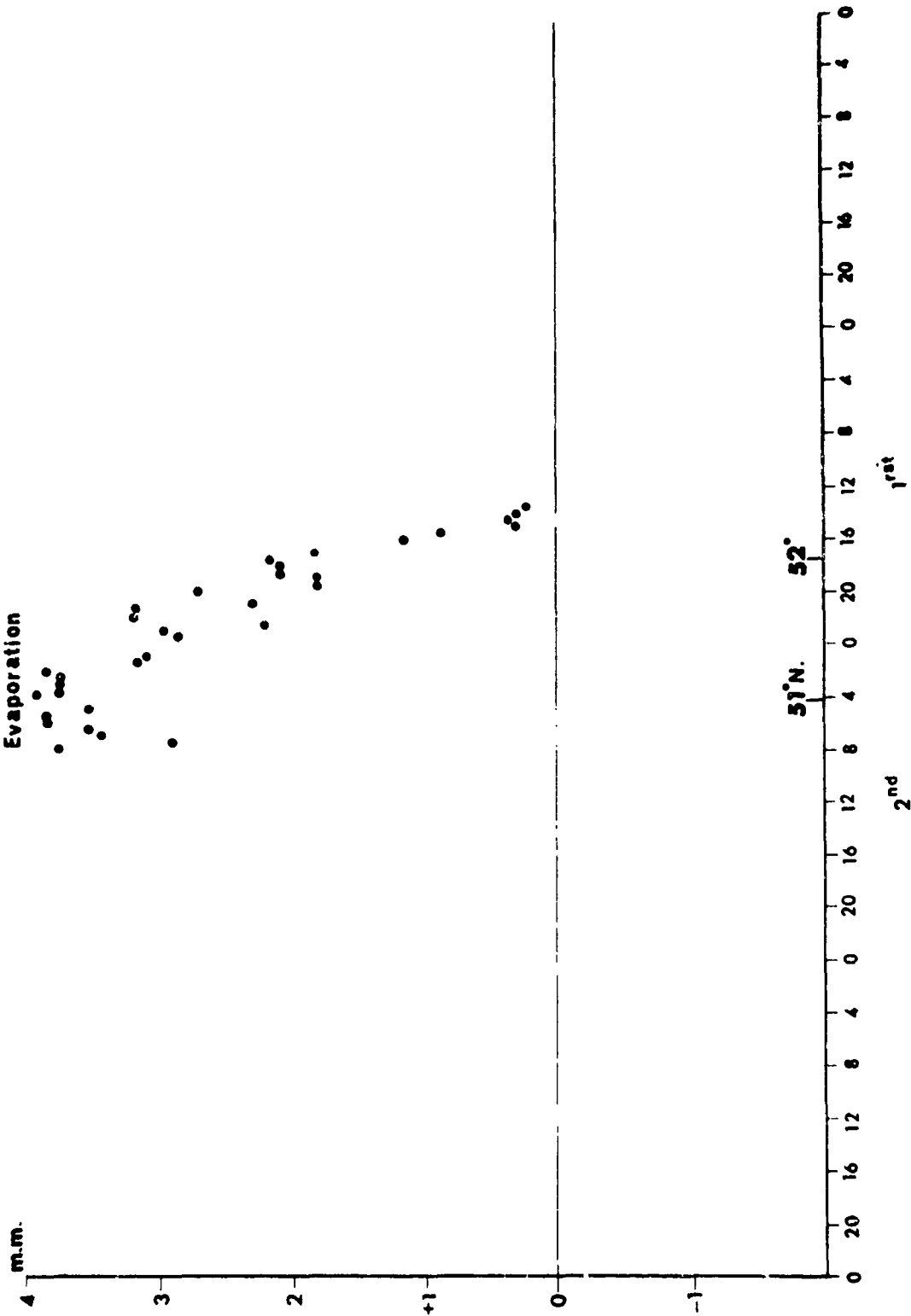
NATO RESTRICTED

MILOC 64

Phase A, lap 5

H.M.S. Dalrymple

Evaporation



October 1964

51°N. 52°

NATO RESTRICTED

MILOC 64

Phase A, lap 5

Maria Paolina G.

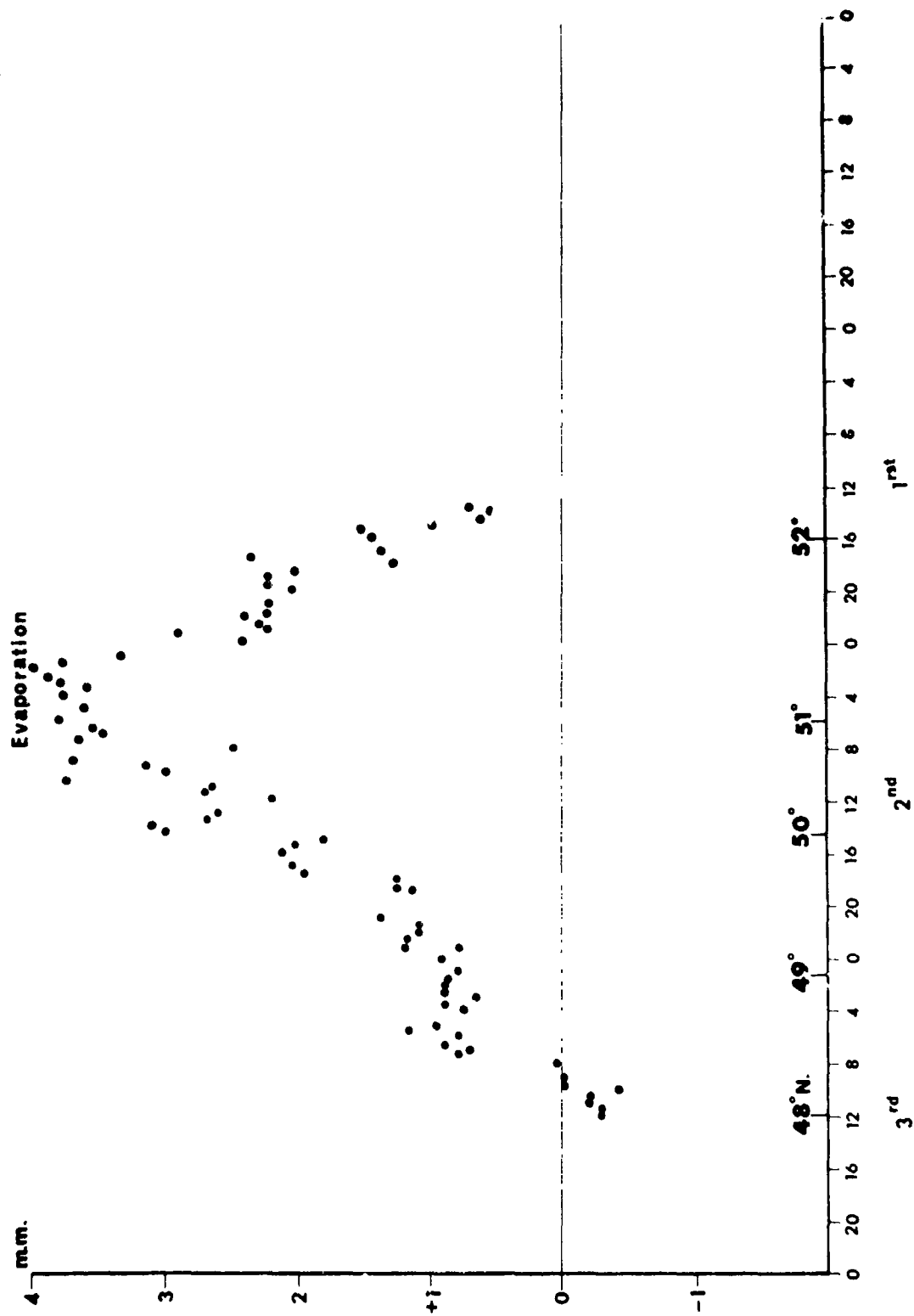


FIG. 5.46

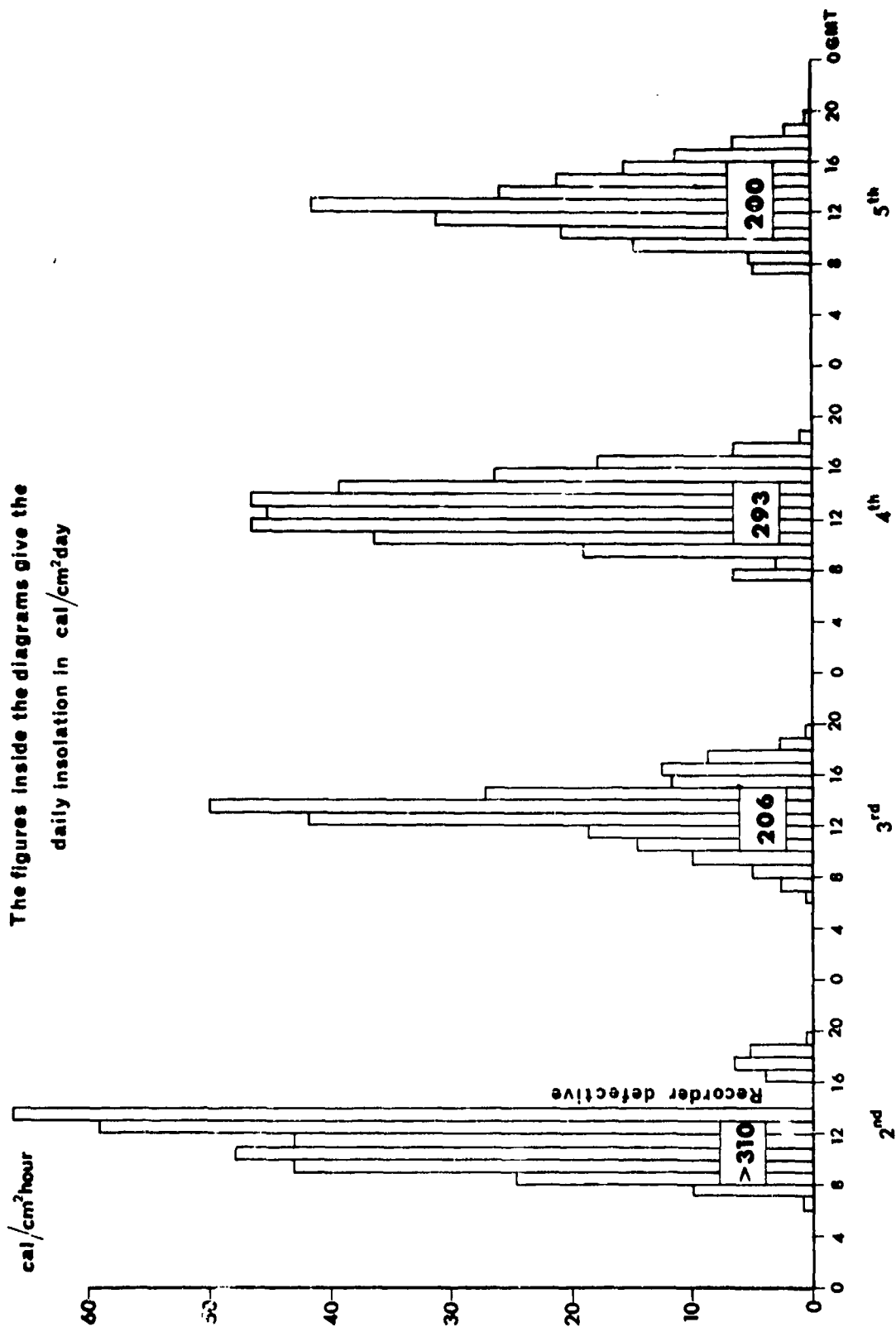
MILOC 64

Phase A, lap 1

H.M.S. Delrymple

Solar Radiation

The figures inside the diagrams give the daily insolation in cal/cm²day

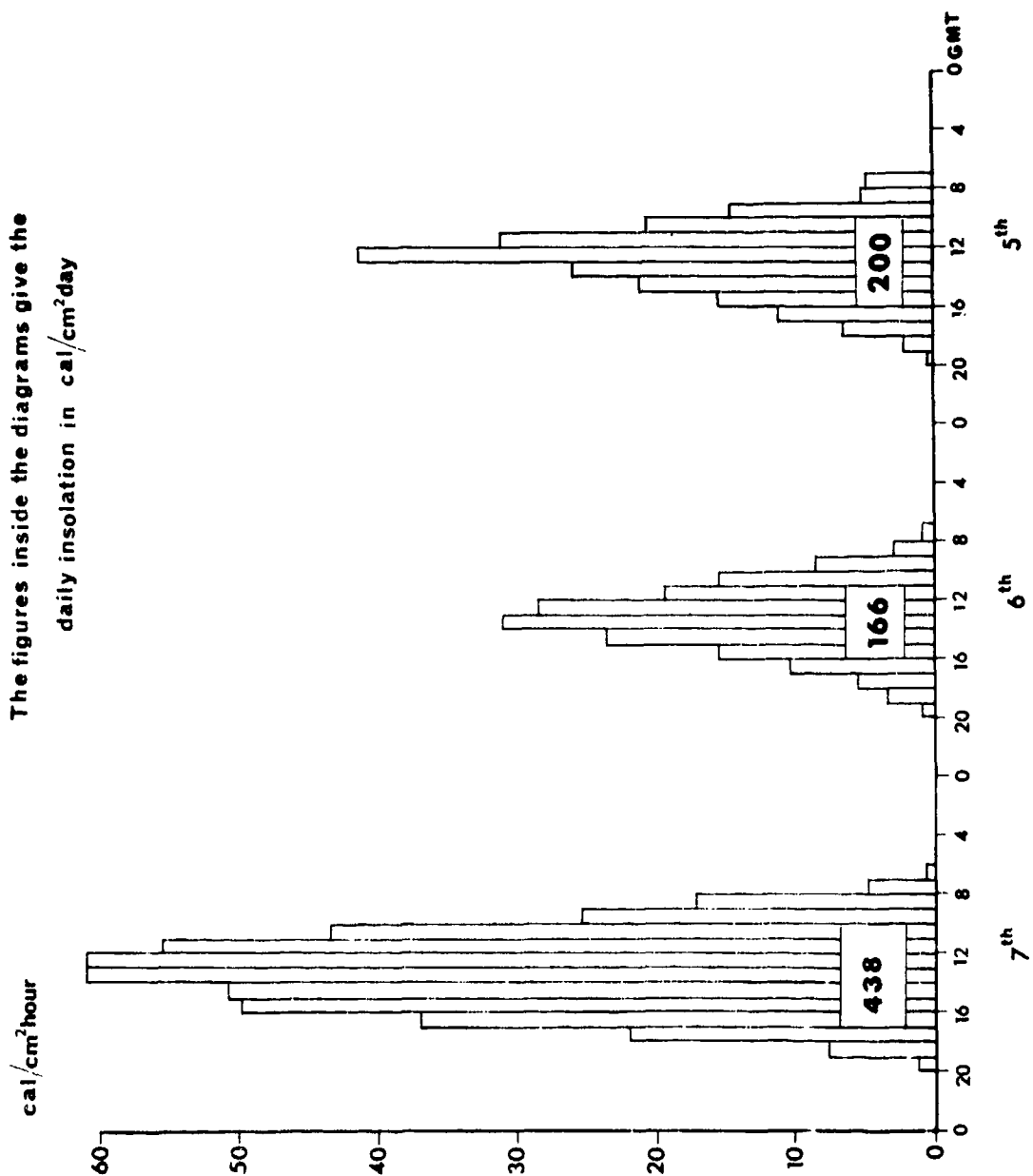


H.M.S. Dalrymple

Phase A, lap 2

Solar Radiation

The figures inside the diagrams give the daily insolation in cal/cm²day



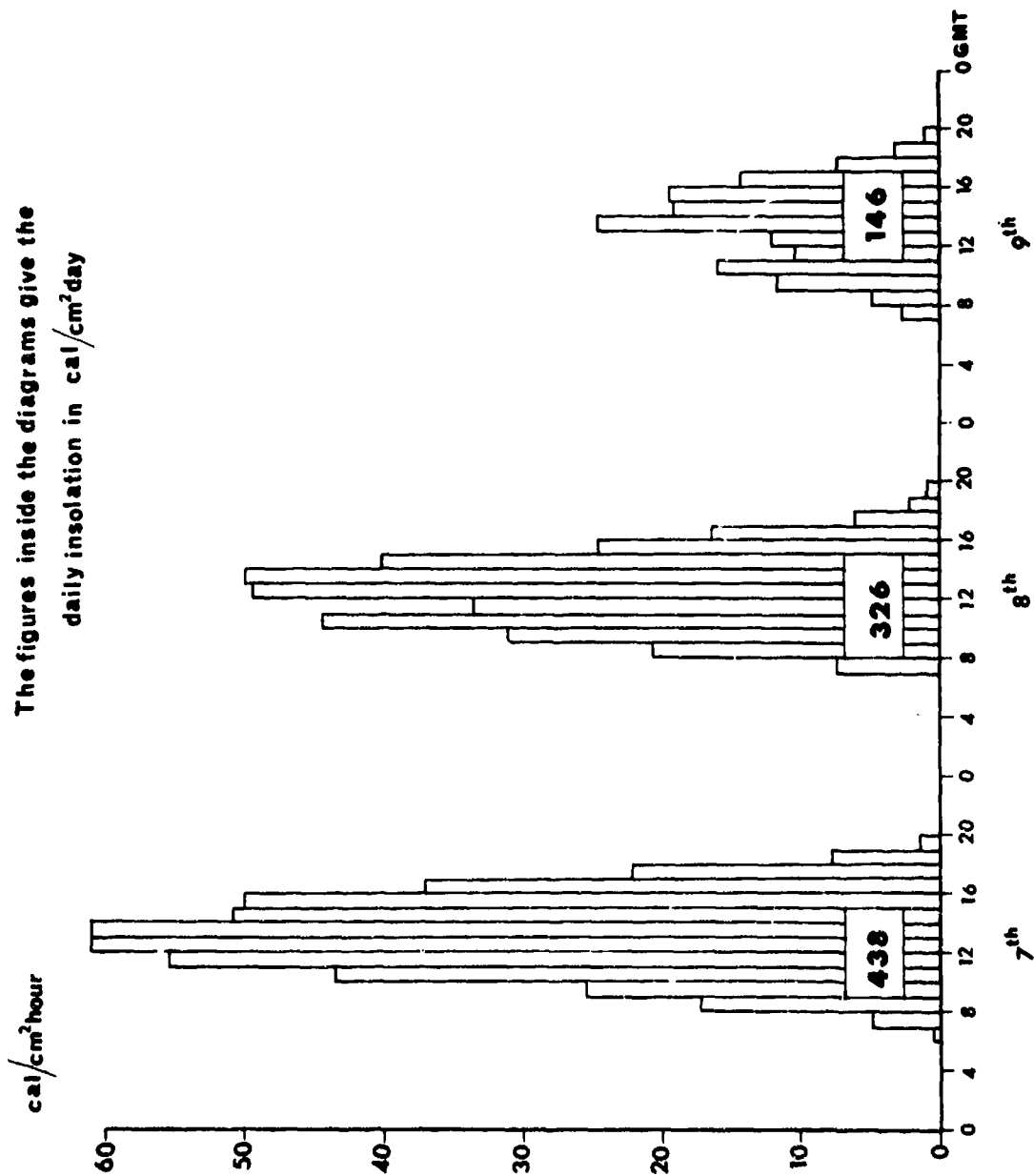
September 1964

Phase A, lap 3

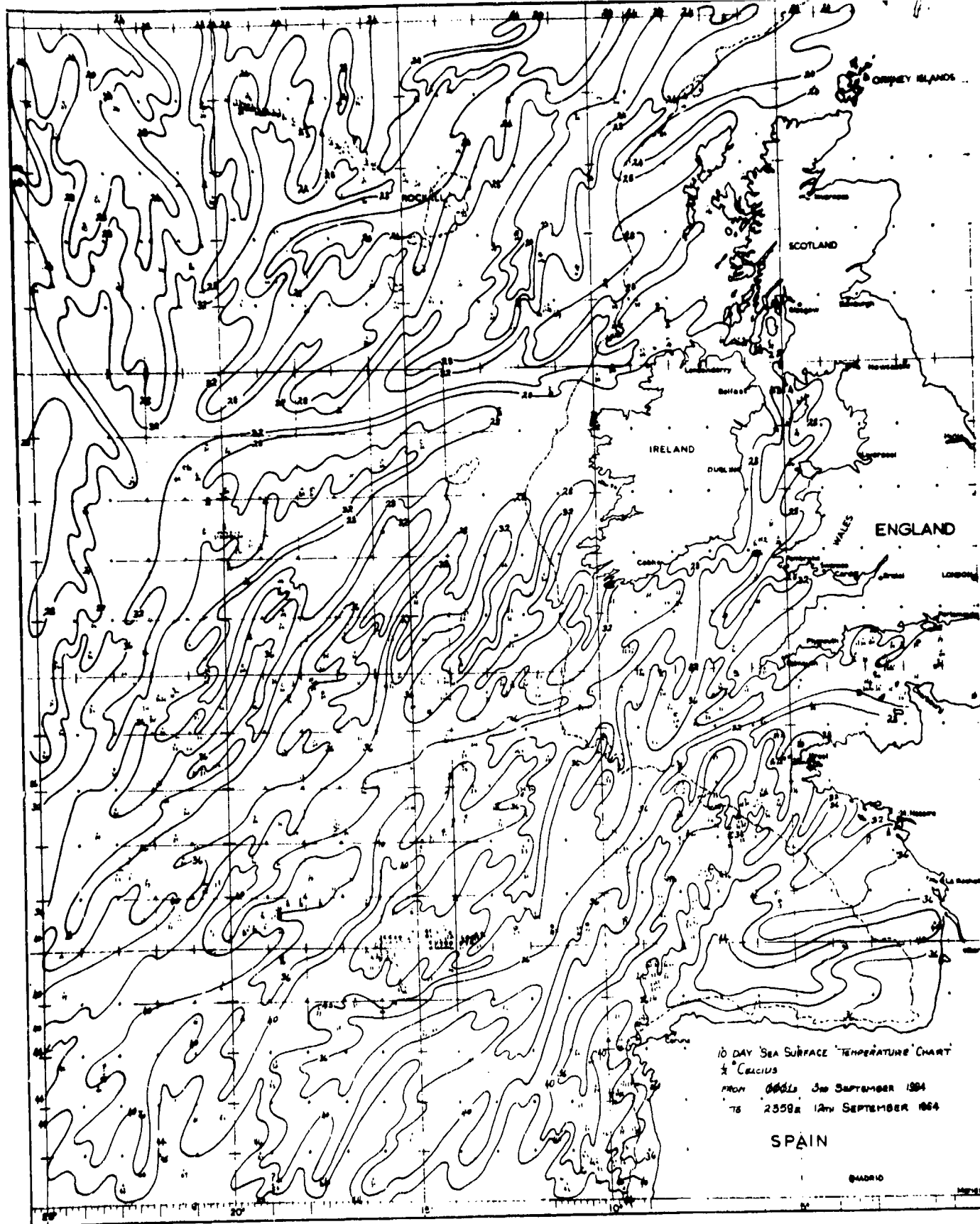
MILOC 64

Solar Radiation

The figures inside the diagrams give the daily insolation in cal/cm²day



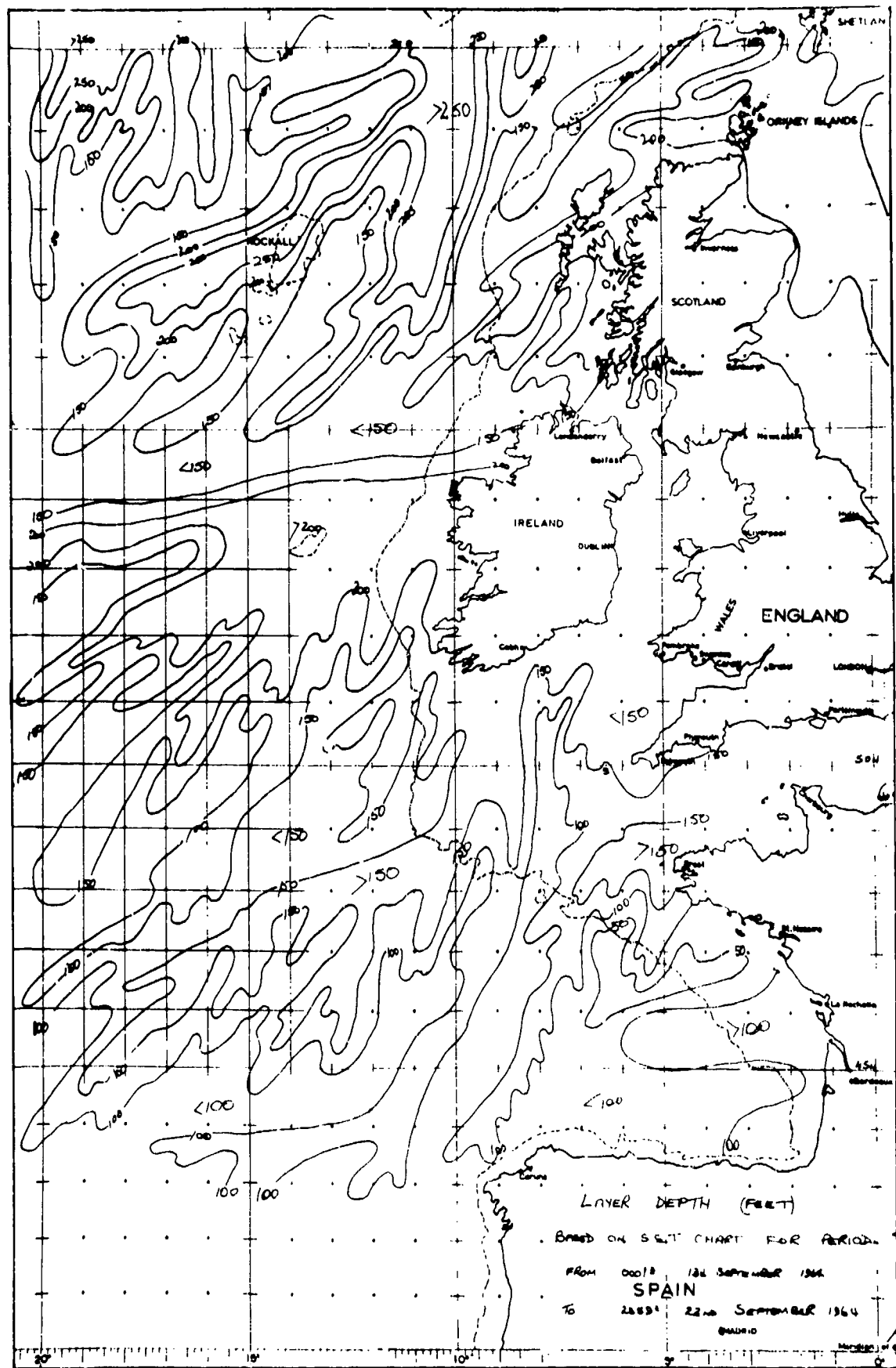
September 1964



ASWEPS MOD (NAVY) U.K

FIG. 6.1

NOTO RESTRICTED

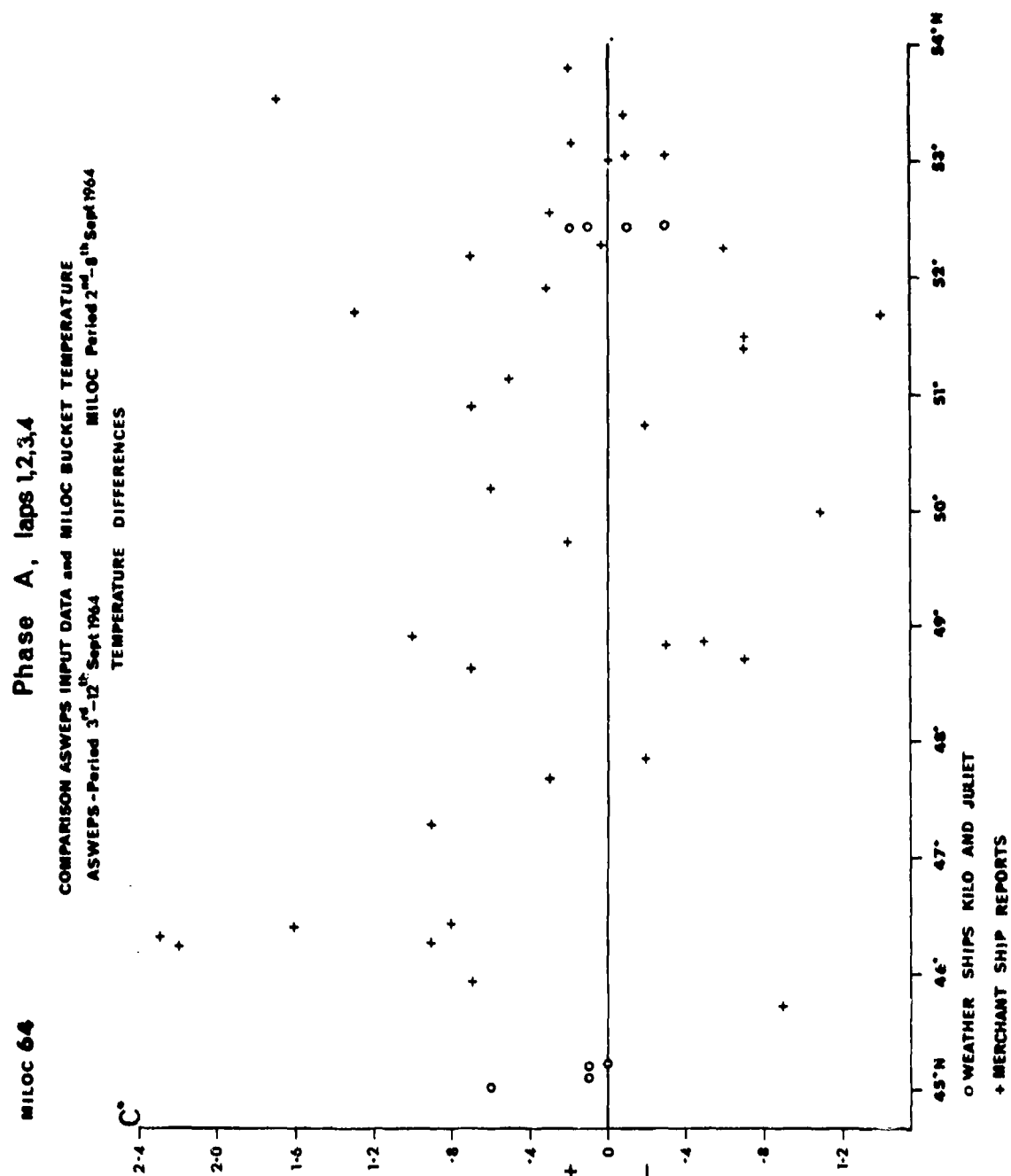


ASWEPS MOD (NAVY) U.K.

FIG. 6.2

NATO RESTRICTED

16



NATO RESTRICTED

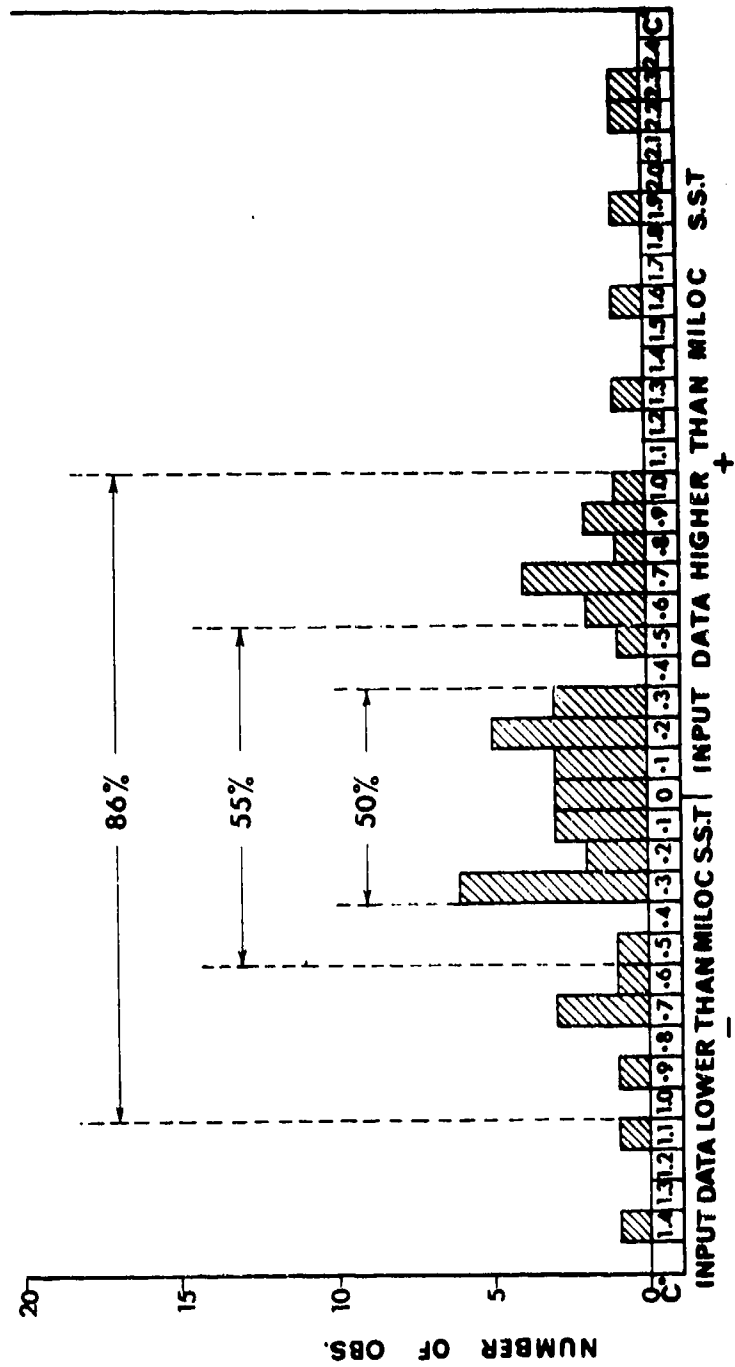
MILOC 64

Phase A, laps 1,2,3,4

COMPARISON ASWEPS INPUT DATA and MILOC BUCKET TEMPERATURE
Asweps Period 3rd-12th Sept 1964 Miloc Period 2nd-8th Sept 1964

DISTRIBUTION OF TEMP. DIFFERENCES

TOTAL OBSERVATIONS: 49



UNCLASSIFIED

UNCLASSIFIED

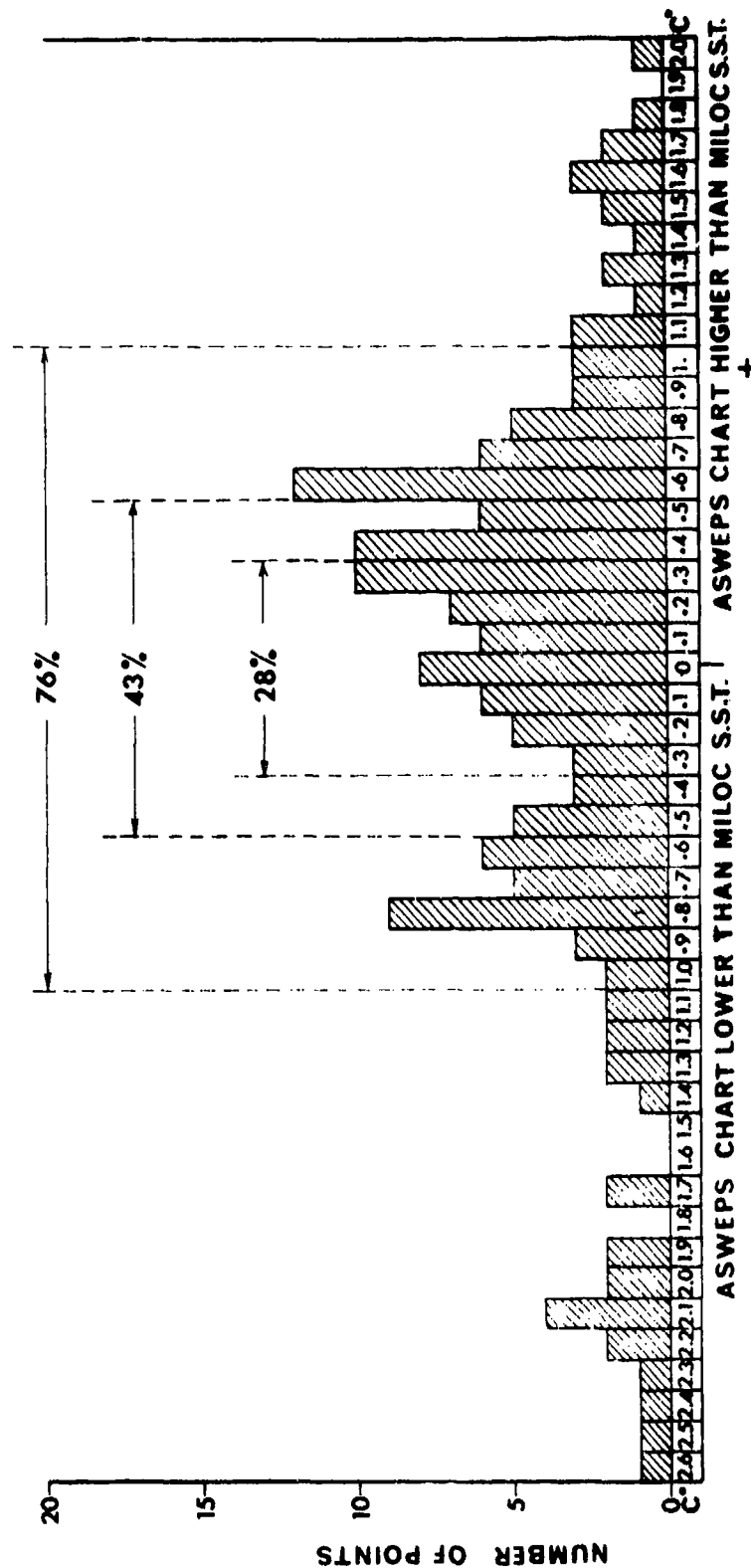
MILOC 64

Phase A, laps 1,2,3,4

COMPARISON ASWEPS ANALYSIS OF INPUT DATA and MILOC BUCKET TEMPERATURE
Asweps Period 3rd - 12th Sept 1964 Miloc Period 2nd - 8th Sept 1964

DISTRIBUTION OF TEMP. DIFFERENCES

TOTAL NUMBER OF POINTS: 162

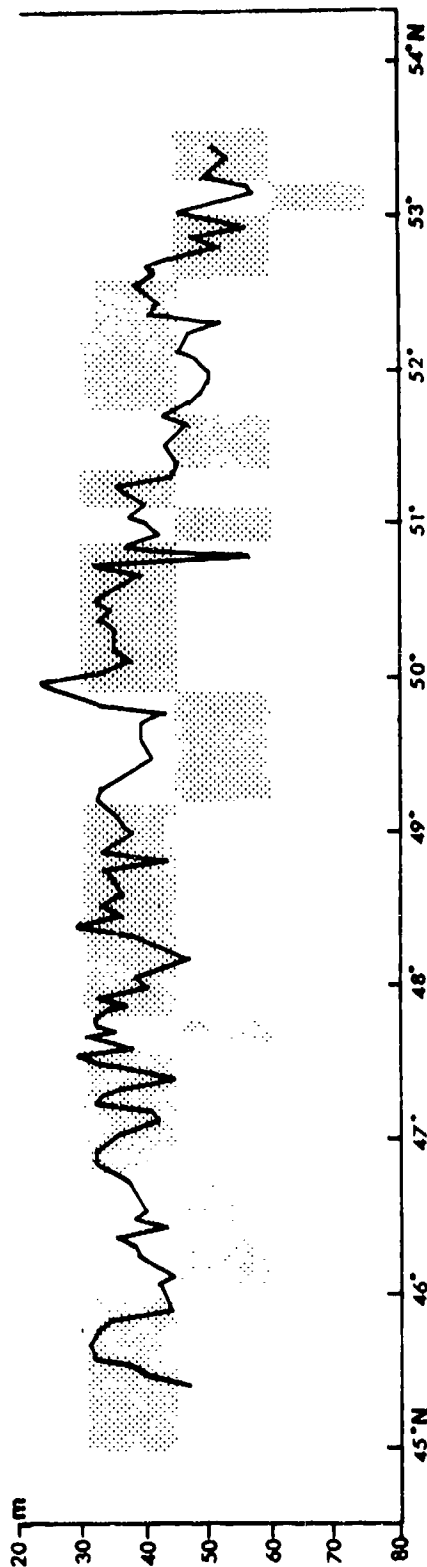


UNCLASSIFIED

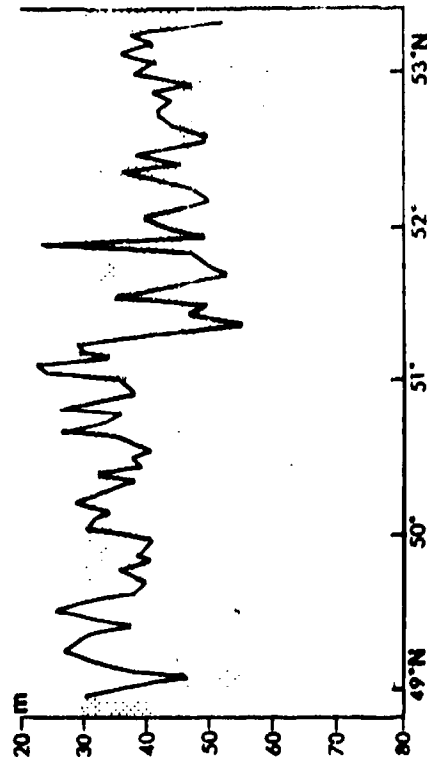
FIG 12

MILOC 64 Phase A, laps 1,2,3, H.M.S. Dalrymple.
COMPARISON ASWEPDS ANALYSIS with ACTUAL LAYER DEPTH
ASWEPDS - Period 13th - 22nd Sept 1964 MILOC Period 2nd - 8th Sept 1964

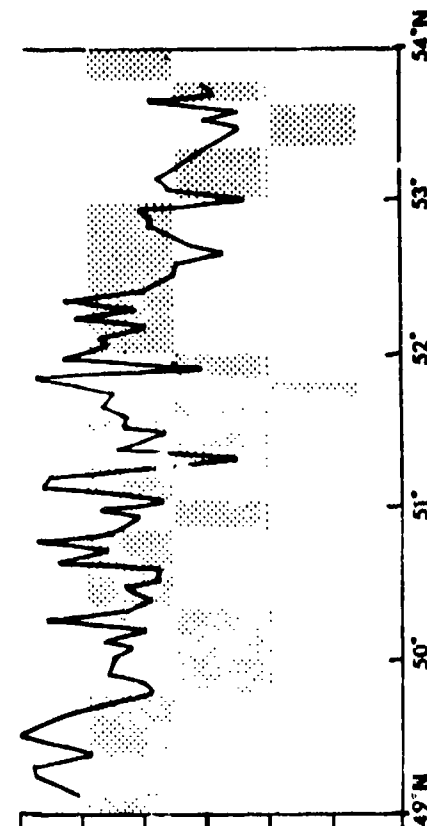
LAP 1



LAP 2



LAP 3



— Actual Layer Depth.

ASWEPDS analysis of 1 min. depth

UNCLASSIFIED

UNCLASSIFIED

MILOC 64

Phase A, laps 1,2,3,4

COMPARISON OF ASWEPS LAYER DEPTH ANALYSIS WITH MILOC LAYER DEPTHS
Asweps Period 13th - 22nd Sept 1964 MIloc Period 2nd - 9th Sept 1964

TOTAL NUMBER OF POINTS: 94

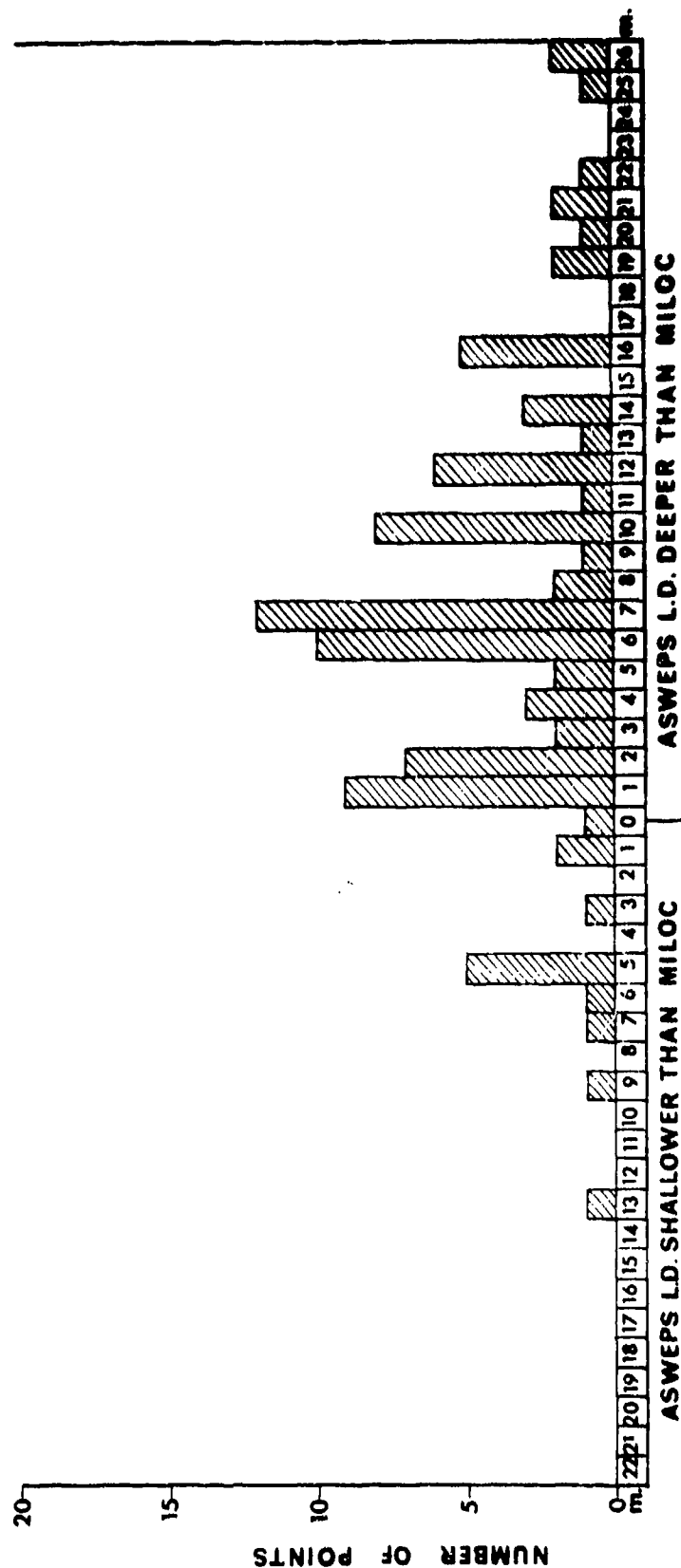


FIG 17

UNCLASSIFIED